Mining
CONGRESS JOURNAL

SAFE
POWER

PLUS

...the high power ability needed for frequent "stop and go" service.

...high maintained voltage throughout discharge.

...the high capacity required for full shift availability.

...an unusually long life.

EXIDE-IRONCLAD BATTERIES
Differ from all other motive power batteries

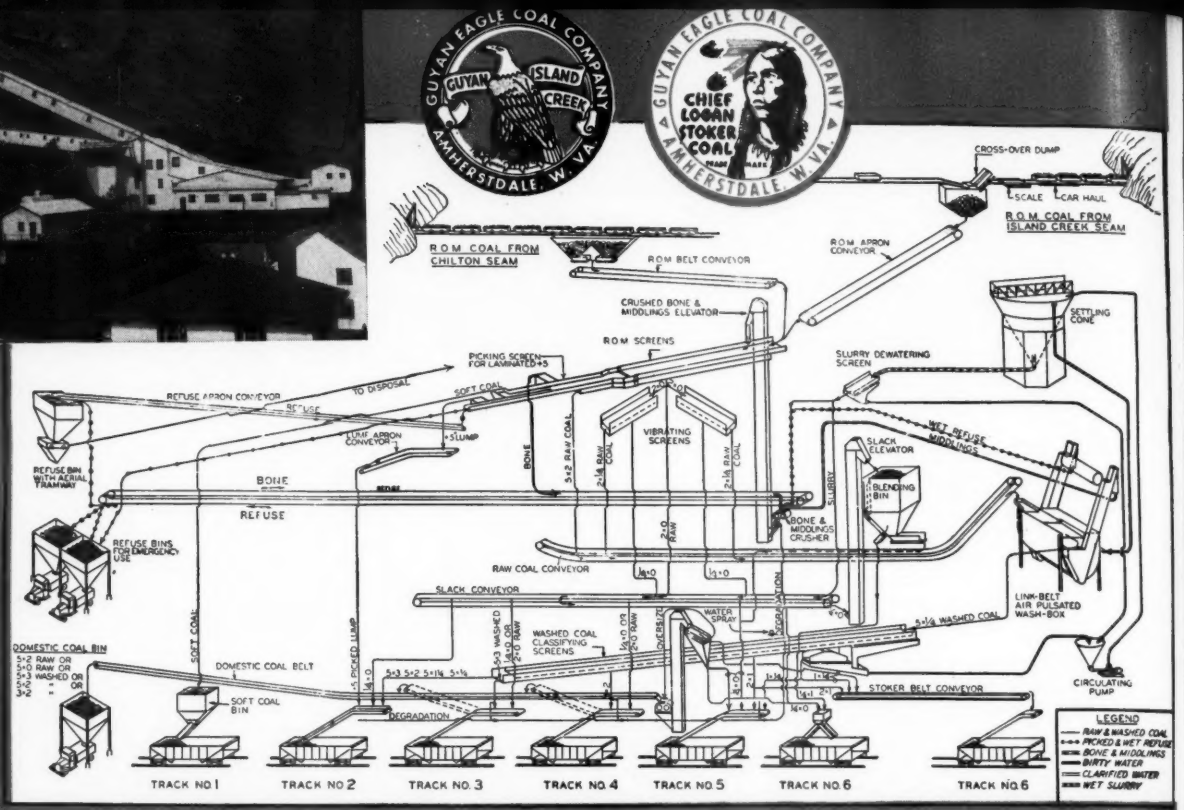
Though most batteries look much alike on the surface, they differ in internal design and construction. These are the differences that count, for they determine battery performance, economy and service life.

One important distinguishing feature of Exide-Ironclad Batteries is the positive plate. This consists of a series of slotted tubes which contain the active material. So fine are these slots that, while they permit easy access of the electrolyte, they prevent the active material from readily washing out. Not only does this add to life of plates . . . and battery . . . it also provides higher power ability and capacity, assuring dependable, day long performance with maximum safety and minimum maintenance.

Use Exide-Ironclad Batteries for your mine locomotives, trammers and shuttle cars. If you have a special battery problem, or wish more detailed information, send for booklet Form 1982.

•

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto



Above and at right: Preparation plant and flow sheet of The Guyan Eagle Coal Company, Amherstdale, W. Va. Below: Link-Belt Air-Pulsated washer. Bottom picture: Coal being loaded.

Another Example of MECHANIZATION *as a coal problem solution*

All signs point to a greater mechanization of preparation and handling as a major solution to the over-all coal problem, through higher efficiency, lower production costs . . . higher quality . . . better labor conditions . . . protection against competition of other fuels.

The flow sheet and pictures illustrate another outstanding sizing and cleaning plant, designed and equipped by LINK-BELT. Preparation is as follows: 1) Coal from the Island Creek and Chilton Seams can be blended or run separately; 2) Plus 5" is handpicked on a shaking picking unit, refuse going to bin for disposal by aerial tramway (now being installed) or truck, and laminated going to crusher for recirculation; 3) 5" x ¼" is washed in a Link-Belt air-pulsated washer; 4) The secondary rejects are screened, crushed, and recirculated through washer to recover coal from laminated material; 5) ¼" x 0" is binned and blended back into nut and slack sizes, in percentages to suit the market, or may be loaded separately; 6) Nut, stove, or egg sizes may be sized to produce additional stoker sizes, the crusher product oversize being recirculated through sizer and fines mixed back with slack; 7) Seven different sizes may be loaded simultaneously. All sizes, except slack are boom loaded and oil-treated.

Let us tell you more about results secured by mechanization at this and other plants.

10,644

LINK-BELT COMPANY

Chicago 9, Philadelphia 40, Pittsburgh 19, Wilkes-Barre, Huntington, W. Va., Denver 2, Kansas City 6, Mo., Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8.

COAL PREPARATION AND HANDLING EQUIPMENT

Engineered, Built and Backed by LINK-BELT

Mining Congress Journal

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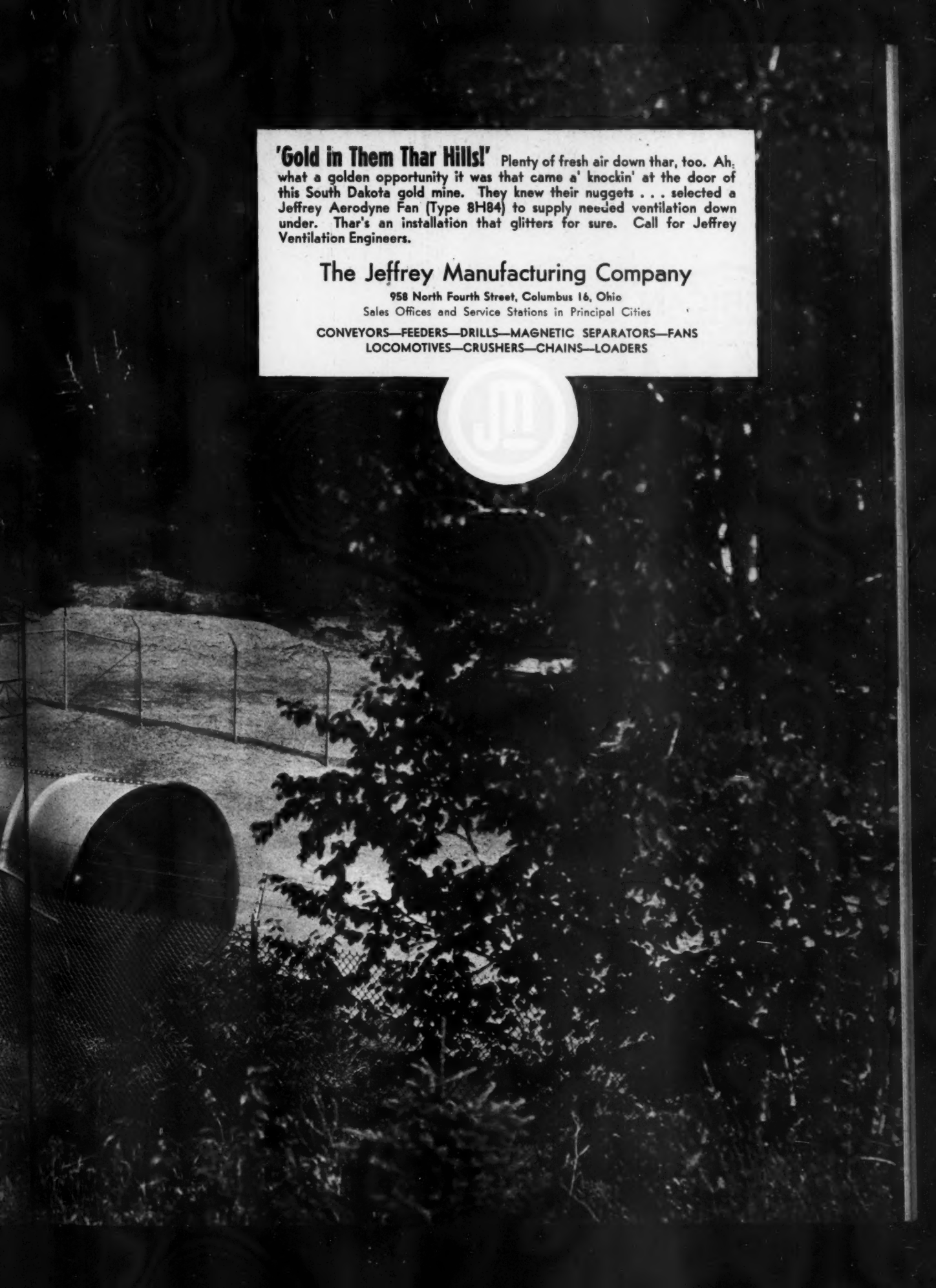

'Gold in Them Thar Hills!' Plenty of fresh air down thar, too. Ah, what a golden opportunity it was that came a' knockin' at the door of this South Dakota gold mine. They knew their nuggets . . . selected a Jeffrey Aerodyne Fan (Type 8H84) to supply needed ventilation down under. Thar's an installation that glitters for sure. Call for Jeffrey Ventilation Engineers.

The Jeffrey Manufacturing Company

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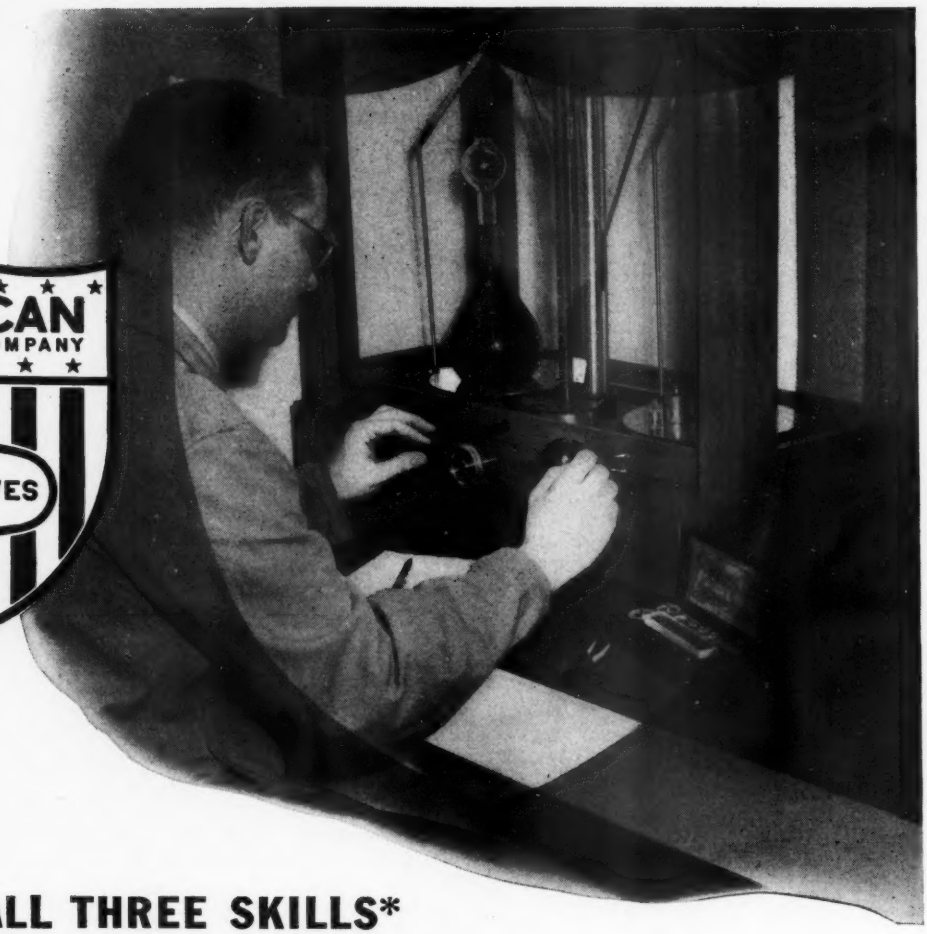
EXPLOSIVES



IT TAKES ALL THREE SKILLS*
TO INSURE MAXIMUM BLASTING EFFICIENCY...

* *Intensive Research*—As a result of intensive research...consistently and successfully applied...only quality chemicals of measured purity go into AMERICAN explosives.

* *Rigid Chemical Control*—Through rigid chemical control and close inspection every step of the way, a complete range of strengths, velocities and densities has been developed to provide a permissible suited to any seam of coal.

* *Technical Skill* and infinite care throughout the manufacturing process assure a high quality product, whatever your blasting requirements.

• *Capable field engineers are available at your call.*

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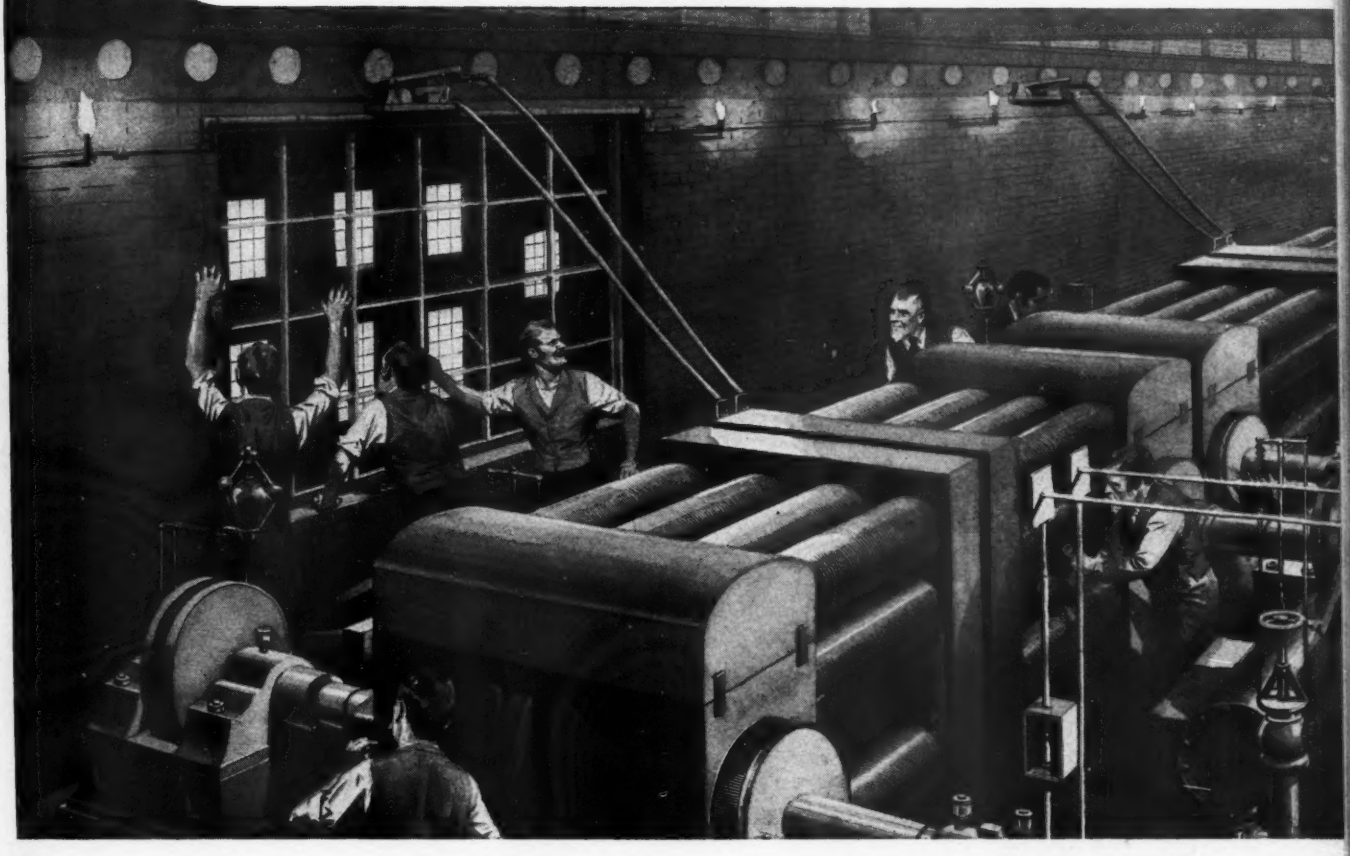
CONFIDENCE...how much is it worth?



IN 1880, when electric lights first were tried on New York's Broadway, Roebling's confidence in the future of electricity motivated a new Roebling undertaking . . . the manufacture of electrical wire and cable.

Roebling's contribution to this great industry during the past sixty-seven years is a matter of record. Its leadership was attained and is being maintained by rigid high standards of quality . . . tireless development of superior products, better processes, and more efficient methods.

Your confidence in Roebling is valued by every Roebling employee. His income depends upon his ability to preserve that confidence. Every Roebling employee knows that you will continue to prefer the output of his hands only if he produces better products and gives you better service. Your confidence in Roebling is Roebling's best salesman.

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WIRE ROPE . . . ONE OF THE FIRST

Wire rope, the first product manufactured by Roebling, plays an important part in every industry. Its economical use depends upon its proper application, and hundreds of men in your industry have found a cooperative and helpful friend to lend a hand when they were puzzled with wire rope problems. He is their Roebling Field Man.

They find that he really knows wire rope and its applications, yet never hesitates to call on the Roebling Engineers and the Roebling Development and Testing Laboratory.

We, here in Trenton, are constantly being reminded by grateful customers of the ability and integrity of their Roebling Field Man . . . of his honest and successful efforts to prove that the words "Confidence" and "Roebling" are one and the same.

At the right is a listing through which your nearest Roebling Field Man can be contacted. Why not call or write him today? Make an appointment to meet a friend who can save you both time and money on your wire rope installations.

Atlanta	934 Avon Avenue . . Raymond 2151
Boston	51 Sleeper Street . . . Lib. 4373
Chicago	5525 W. Roosevelt Rd. . . . Crawford 6400
Cleveland	701 St. Clair Ave., N.E. . . . L.D. 249 & Main 5030
Denver	1635 Seventeenth St. . . . East 2684 & Keystone 4111
Houston	6216 Navigation Blvd. . . . Woodcrest 6-8316
Los Angeles	216 S. Alameda St. . . . Trinity 1261
New York	19 Rector Street . . . Wh. 3-5200
Philadelphia	12 S. 12th Street . . . Market 7-2751
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Manufacturers of Wire Rope and Strand • Fittings • Slings • Screen, Hardware and Industrial Wire Cloth • Aerial Wire Rope Systems • Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Ski Lifts • Electrical Wire and Cable • Suspension Bridges and Cables • Aircord, Aircord Terminals and Air Controls • Lawn Mowers

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A CENTURY OF CONFIDENCE

GOODMAN TROUGHED

GOODMAN MANUFACTURING COMPANY HA

BELT CONVEYORS...

FOR FAST, LOW COST TRANSPORTATION OF COAL UNDERGROUND

Gathering service and main entry haulage, any practical lengths — each unit rated to meet load requirements from shaker, chain, belt or shuttle car feeders.

12848

NY HALSTED STREET AT 48TH • CHICAGO 9, ILLINOIS

UNITED STATES RUBBER COMPANY

SERVING THROUGH SCIENCE

THE NEW U.S.
Conveyor Belt
2½ TO 4 TIMES STRONGER!

Permits Higher Tensions, Longer Hauls, Higher Lifts and Greater Tonnages

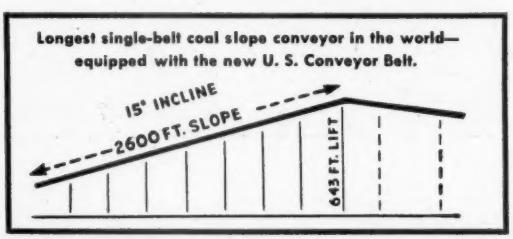
By combining two famous textiles—Ustex* and nylon—scientists of United States Rubber Company have created a new conveyor belt with these exceptional characteristics:

- 2½ to 4 times stronger than the strongest duck-and-rubber conveyor belt ever produced—made possible with the world's strongest cotton yarn—Ustex—another U. S. Rubber development—
- Greater troughability—due to use of flexible nylon—
- Possible to repair quickly in case of accident—with the same equipment and same techniques already known to maintenance men—
- Economical to operate—due to longer centers—fewer transfer points—
- Less than one-half the weight of a conventional duck-and-rubber belt of equivalent strength.

This new "U. S." Belt was designed especially for those extra big conveyor jobs, involving high tensions, longest possible center distances, high lifts and capacity tonnages.

Maybe this new Engineered Rubber Belt will help you solve a difficult material-handling problem. Write to Mechanical Goods Division, United States Rubber Company, Rockefeller Center, New York 20, N. Y.

Ustex—Registered Trade Name of United States Rubber Company



Longest single-belt coal slope conveyor in the world—equipped with the new U. S. Conveyor Belt.

Interesting story of this installation told in brochure available on request. Ask for M-7848.

Fast, Low-Cost

CUTTING

. . . With KENNAMETAL Cutting Machine Bits

DRILLING

. . . With KENNAMETAL Blast Hole Drill Bits

It's highly unlikely that you would use mining machines, loaders, locomotives or drills that delay operations and cost a lot to keep on the job. Also it is just as important to use bits that cut and drill faster, wear longer, and cost ***less*** to keep on the job.

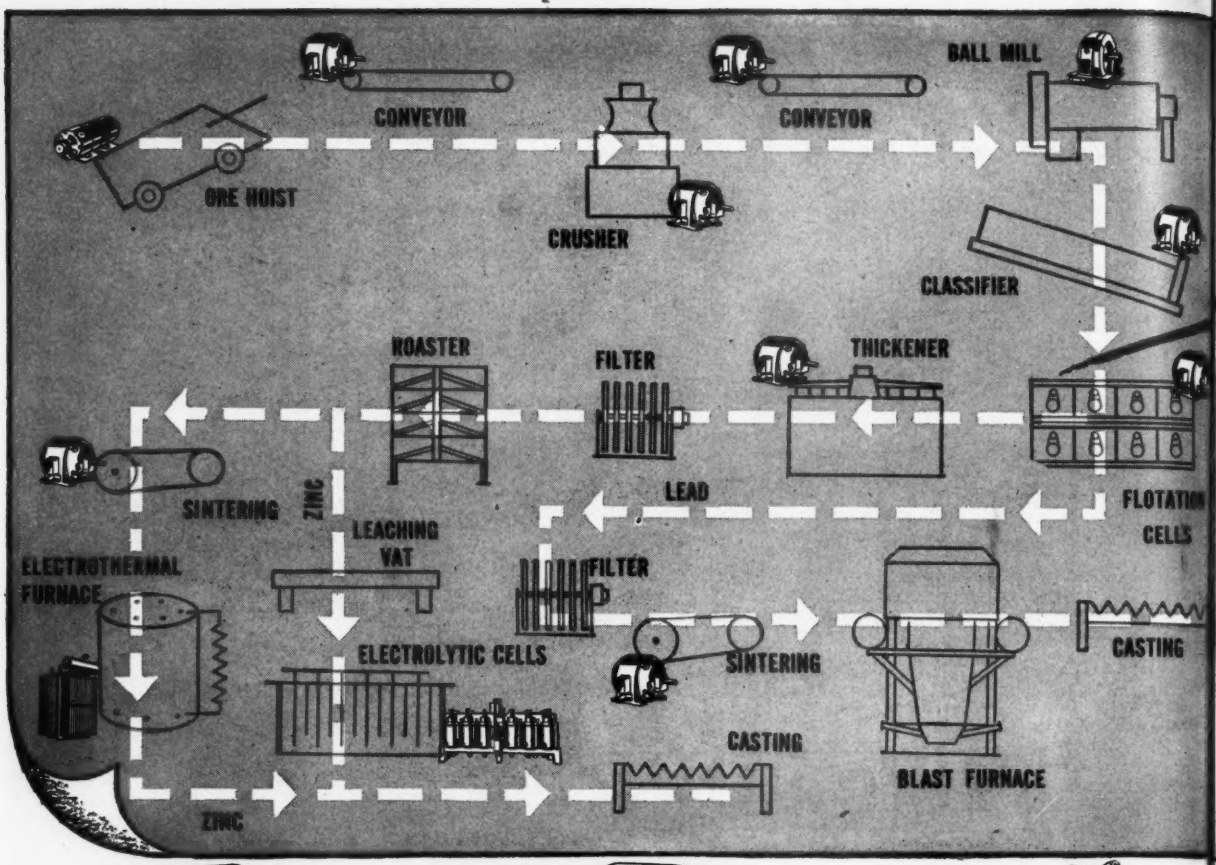
Kennametal bits have a hard, durable, shock-resistant cutting edge that makes them more practical and economical for preparation work than any other bit yet developed. For example, where steel bits are changed or reset 2 or 3 times per cut, Kennametal cutting machine bits have made 40 cuts or more without being changed, reset, or individually replaced. The time and trouble of making bit changes is reduced to a minimum—the time gained goes into actual cutting and drilling, which contributes to increasing the total output of your mine.

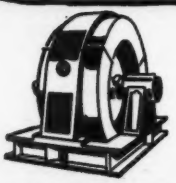
Write for factual performance data "form MM-60" or ask for one of our representatives to call. No obligation.

KENNAMETAL

MINING DIVISION

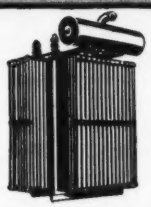
KENNAMETAL INC., LATROBE, PA., U. S. A.



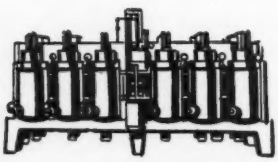


G-E SYNCHRONOUS MOTORS for driving continuous-speed machinery and improving power factor

TRI-CLAD OPEN (DRIPPROOF) MOTORS for general-purpose a-c motor applications where the extra protection of cast-iron frame construction is needed

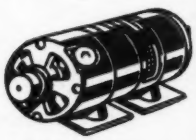


G-E TRANSFORMERS for reducing voltage to utilization levels where electric power is used in a smelting process

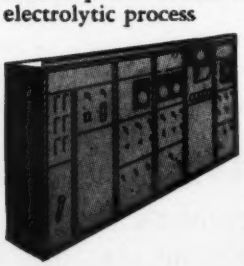


G-E POWER RECTIFIERS for converting a-c to d-c where electric power is used in an electrolytic process

ELECTRICAL EQUIPMENT for the lead and zinc industry



G-E AMPLIDYNE CONTROL as a current—and speed-regulating device on mine hoists or a current-regulating device on electric furnaces



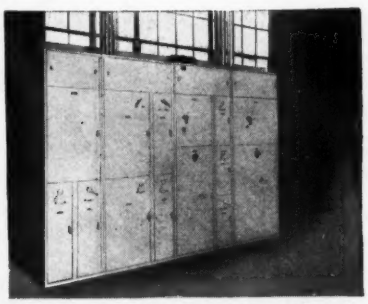
G-E CABINETROL® enclosed control panel equipment as a means of centralizing low-voltage motor controls (not shown on chart) ®Reg. U. S. Pat. Off.

G-E LIMITAMP CONTROL for high-voltage control with adequate short-circuit protection built in (not shown on chart)

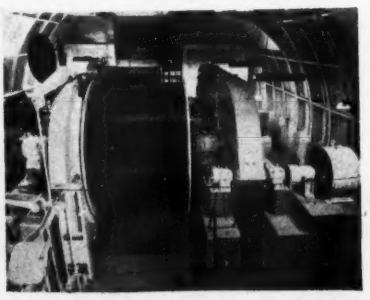
From ore to Pigs and slabs

"PACKAGED" G-E ELECTRIC DRIVES

are easier to buy... cost less to operate



Cabinetrol® enclosed control panel equipment groups low-voltage controls into one dead-front factory-assembled unit.



One of two 600-hp, Amplidyne-controlled d-c motors driving an underground ore hoist in a western zinc-lead mine.

When you buy a "packaged" General Electric drive for any of your concentrating and smelting processes, you save time and money on two counts.

First, you get all the advantages of dealing with one manufacturer instead of three or four because General Electric builds all the components of a drive—motors, controls, cable, and power distribution equipment—advantages available to you *only* when you deal with General Electric. A General Electric industry specialist assumes responsibility for the endless details involved in ordering and securing delivery of all the components of the drive. Moreover, his help and experience are available *after* delivery, as well—until the drive is installed and running smoothly.

Second, a "packaged" General Electric drive is an engineered system, designed to meet a specific set of conditions. In co-operation with your own technical personnel, General Electric makes sure that motor types, cable sizes, and control capacities are right for the job. For the life of the drive, this co-ordination pays off—in smooth, efficient operation with less down-time for maintenance and repairs. When discussing electric drives, be sure to get the help and recommendations of your local General Electric representative. There's no obligation. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

660-12

HOW TO BRING DOWN TWO "OVERHEADS" AT ONCE

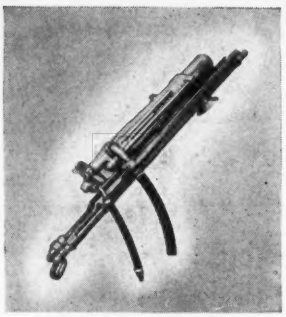
Drilling smoothly and easily into the hardest rock, this Blue Brute Stoper is cutting down maintenance costs at the same time. It's the new, self-rotating WR-31 — a fast, tireless performer that will do a lot of heavy drilling for you on very little air.

From end to end the WR-31 is crammed with new design improvements. For instance, the ratcheted rifle bar engages four air-operated pawls on the piston's backstroke. There's positive action here, with extra solid, longer lasting construction — and it's exclusively Worthington!

That proper position of the holding handle — *above* the centre of gravity for better balance — will make a big hit with your runners. They'll like the shielded, down-directed exhaust and the air and water tube construction which insures a constant air stream that keeps sludge and water out of the shielded type chuck.

Men who use stopers *know* stopers—and you'll save money by giving them equipment that combines easy handling with tops in efficiency. How about letting them get the "feel" of the new WR-31 in an easily arranged demonstration? Watching this speedy, economical Blue Brute in action will prove to you, that *there's more worth in a Blue Brute.*

Write for literature describing the complete line of BLUE BRUTE Mining Equipment, including Drifters, Stopers and Hand Drills.

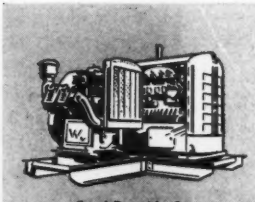


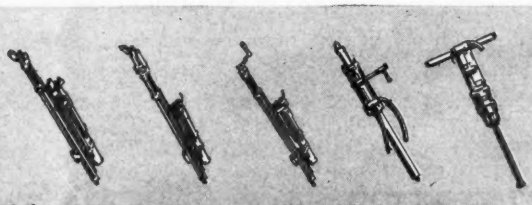
BLUE BRUTE DRIFTERS

Types WPM (Pneu-Motor Incorporated in Drifter), WPMS (Pneu-Motor on Shell), and WHC (Hand Crank). Featuring the new, *balanced* design for faster drilling cycles and all-around operating economy.

BUY BLUE BRUTES

H7-11

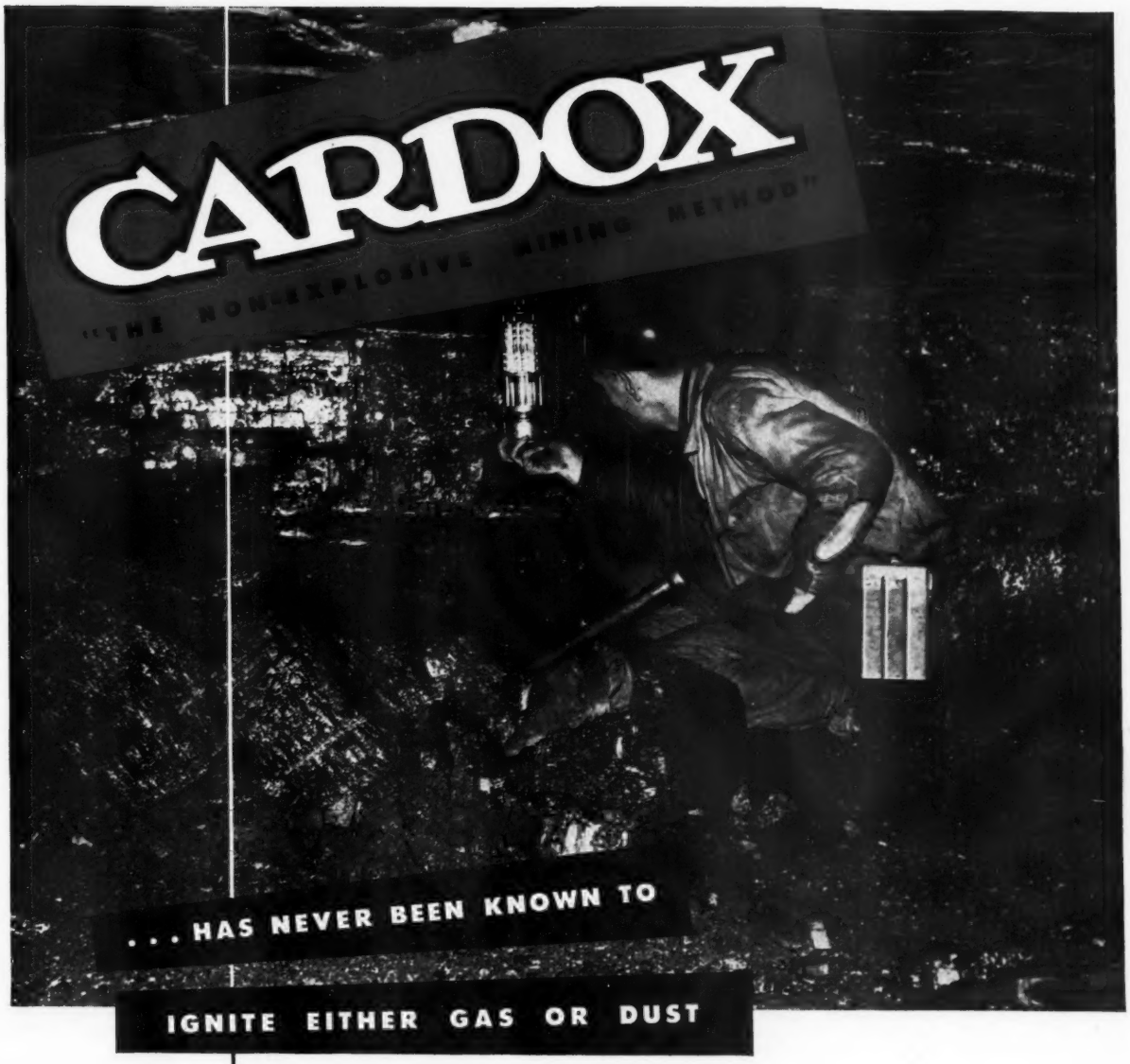




Semi-Portable Compressors. Drifters with Feed Motor Incorporated. Drifters with Feed Motor on Shell. Hand-Crank Drifters. Stopers. Hand-Held Rock Drills.

WORTHINGTON

Worthington Pump and Machinery Corporation. Worthington-Ransome Construction Equipment Division Holyoke, Mass.



CARDOX mining adds to the advantages of increased realization, and decreased degradation the assurance of maximum safety throughout face preparation.

The mild heaving, shearing action of CARDOX reduces roof-failure hazards — squares up both face and rib so that dangers resulting from overhanging face in high seams are greatly reduced. The discharge of a CARDOX Tube has never been known to ignite either gas or dust — although CARDOX is widely used in gassy and dusty mines.

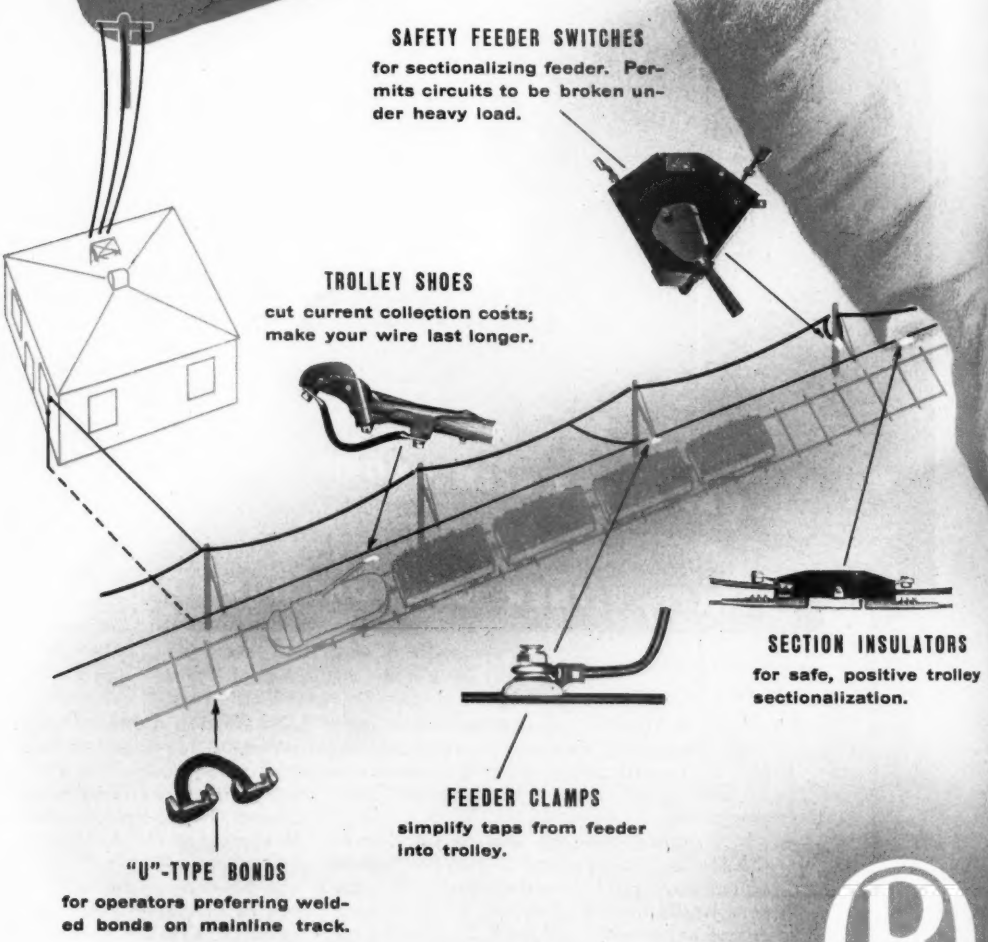
Carbon dioxide, which provides the powerful heaving action used by CARDOX to dislodge coal, is one of the fastest and most effective fire extinguishing mediums known. It penetrates where water or rock dust cannot reach, it can be used safely to extinguish electrical fires, and it will not damage machinery. CARDOX Tubes are in fact emergency fire extinguishers readily available in all mines where CARDOX is used.

Write for full details on free demonstration of CARDOX safety and profit features in your own mine.

CARDOX CORPORATION • BELL BUILDING • CHICAGO 1, ILLINOIS

Complete From Substation to Face. An O-B Power Handling System

To put controlled power where and when you need it, install O-B Power Handling Materials from substation to face. A number of such devices are shown here. Why not check each one carefully to determine how many can help solve your power distribution problems.



SAFETY FEEDER SWITCHES
for sectionalizing feeder. Permits circuits to be broken under heavy load.

TROLLEY SHOES
cut current collection costs; make your wire last longer.

SECTION INSULATORS
for safe, positive trolley sectionalization.

FEEDER CLAMPS
simplify taps from feeder into trolley.

"U"-TYPE BONDS
for operators preferring welded bonds on mainline track.

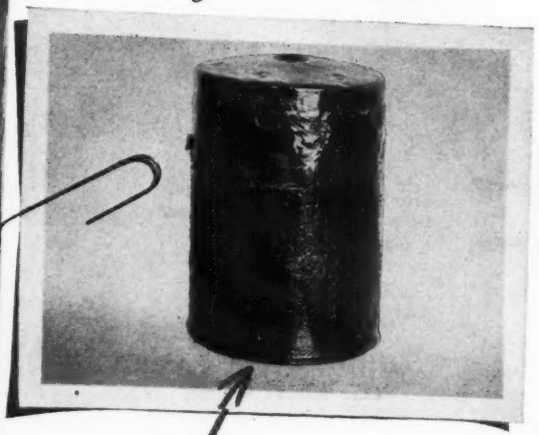
MOVE MORE COAL FOR LESS MONEY

MOTOR STARTERS
control and protect conveyor drives.
FUSED TROLLEY TAPS
protect cables from burnout.
GROUND CLAMPS
grip rail edge or bond cable in a tight, vibration-proof ground connection.
EXPANSION BOLTS, HANGERS AND TROLLEY CLAMPS
to meet any trolley support problem above or below ground.
FROGS
for safe, sure trolley wire turnouts.
DUAL SUSPENSION CLAMPS
support both feeder and trolley from one hanger.
WEDGE BONDS
save time and money; are adaptable for all types of bonding.
DISTRIBUTION BOXES
act as portable switch panels for face set-ups.
Ohio Brass
MANSFIELD, OHIO
Canadian Ohio Brass Co., Ltd., Niagara Falls, Ontario
2790-M

WITH O-B MINE-TESTED MATERIALS

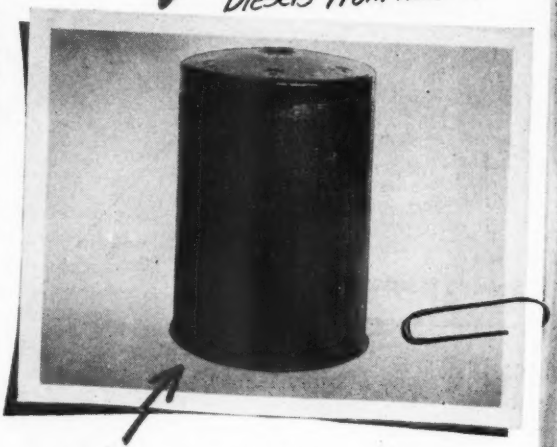
LUBE MEMO

How Joe stopped Filter Clogging



Joe says filters have gummed up like this after about 600 hours on oil he's been using

Joe says nothing but RPM Delo Oil in his Diesels from now on



Here's how the filter looked after 600 hours on RPM Delo Diesel Engine Lubricating Oil

Joe finds RPM Delo Oil keeps filters clean because:

1. It's compounded to resist oxidation and minimize sludge.
2. Its "detergent" cuts down sludge.
3. It remains stable in the presence of moisture.

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Mining
CONGRESS JOURNAL

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JULIAN W. FEISS, Editor

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TAXES AND THE MINE OPERATOR

IN July of this year the Tax Committee of the American Mining Congress, under the chairmanship of H. B. Fernald, presented to the Committee on Ways and Means of the House of Representatives a comprehensive statement urging changes in the Revenue Code that would permit fair and equitable treatment of the mining industry. Since this presentation was the result of months of study and extensive consultation by the AMC Tax Committee, and since it has been widely distributed throughout the mining industry, no attempt will be made to repeat in detail its findings.

Probably no phase of Government policy is of greater importance to the future of mining than our tax laws and their administration; and a few basic principles are worth emphasis at this time.

To begin with, there must be recognition of the special nature of mining enterprise—the fact that a mine's capital value is depleted as the mineral is taken out—and of the financial hazards inherent in searching for and developing mineral deposits. Income taxation must be so applied as to fall only on profits and not on capital. Taxes must be imposed only at such rates and in such manner that investors have a reasonable chance for a return, *after taxes*, sufficient to justify the risks. Allowances for depletion and for the recovery of development expenses must not be denied or curtailed through technicalities of interpretation, and any uncertainties in the law should be removed, where necessary, by Congressional action.

Since the perpetuation of the industry will require the discovery and development of new mineral deposits—frequently at great depths and involving far greater costs for exploration than in the past—and since means must be found to permit the working of known low grade ore bodies, tax policies that kill incentive to mining enterprise can sap our industrial strength for both peacetime production and wartime defense.

Mining must once more be made desirable as an investment for risk capital. Prospecting must be stimulated and the work of the small mine operator encouraged. Here we will quote two sentences from an editorial from the *London Economist* of March, 1903: "The speculative side of mining has an attractiveness which is at the bottom of the enery with which it is prosecuted. Strike out the mines which are not sound investments from the undertakings into which a sensible man should put his money and you shrivel legitimate mining into a dry business which would soon wither from want of life."

PLAYING TO THE GRANDSTAND

ON September 12, Senator Martin of Pennsylvania addressed a group of leading steel producers who had been summoned to appear before a Senate subcommittee investigating the steel situation. Opening this hearing, he said that he realized "that steel is a tough business" but that "in the steel business, or in any other business, management has no more right to adopt a 'public be damned' attitude than labor or Government." He warned that there is a "growing pressure for nationalization of such big industries as steel, coal and the railroads" and declared "it would be downright stupid for your business to take that position."

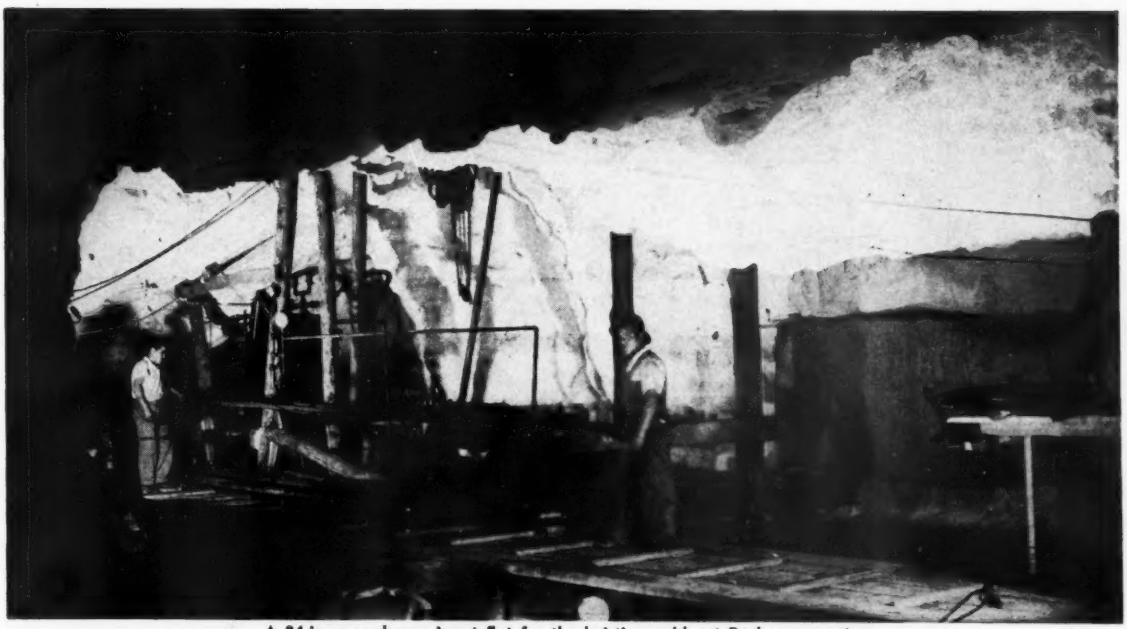
Our American steel industry requires no apologist. For more than a generation this nation has led the world both in steel production and in the quality of its output. American steel hammered Germany to submission in two world wars. American steel ships carried millions of troops and tons of munitions in both conflicts, American steel bolstered a faltering Russia in 1942, American steel made possible the victory over Japan in the Pacific. During the war years our steel industry averaged eighty-five million tons output annually—a record that no other country has even approached.

Our national sinews are essentially fashioned of minerals and metals and were it not for the initiative and service of the iron and steel and other mineral industries, our leadership in railroading, the automotive industry, construction and manufacturing, would not exist today.

Steel has been in no different category from any other industry in the post war world; conversion from wartime production has been difficult and in some cases slow. Benjamin F. Fairless, President of the United States Steel Corporation, in a statement before the same Senate subcommittee, said that industry has lost eighteen million tons of steel as a result of coal and steel strikes since V-J Day. He also stated that the industry is today producing the largest amount of steel in our peacetime history.

Although there are many politicians who claim to be strong advocates of the American free enterprise system, they are apparently courting the headlines by attacking one of our country's outstanding industries—one that has prospered to the public's benefit under our free enterprise system. From now on, and until the end of our next national election period, there will be open season for sniping at any business that has been unusually successful. We predict that such attacks will be properly evaluated by the public for what they are—grandstand plays.

Exploration Drilling at Pachuca



A 24-in. rear sheave is set flat for the hoisting cable at Pachua operations

★

By C. J. BARBER
Supt., Mining Engineering Dept.
Cia de Real del Monte y Pachuca
Pachuca, Hidalgo, Mexico

★

At Pachuca and Real de Monte, Mexico, the Drilling of Horizontal Holes Exceeding 2,000 Ft. in Length Has Become a Routine Operation. Drilled From Stations Cut Underground, These Long Holes Have Proved Far More Effective Than Shorter Inclined Holes Drilled From the Surface

POSSIBLY the longest horizontal diamond drill holes [1] ever drilled have been used by Compañia de Real del Monte y Pachuca as an aid in developing its silver mines. Much of the production in recent years has come from new ore shoots discovered by diamond drilling. The long holes described herein, and mentioned only briefly elsewhere, [2, 3] formed but a part of the drilling program, of which the balance was of a more routine nature. A small crew, with a modest investment in equipment, has examined a large area at a fraction of the cost and time required by other methods. There have, however, been expensive failures; stuck and abandoned bits alone represent thousands of dollars. Nevertheless, in general, long hole drilling has been an economic success. The methods used are not entirely novel, but may interest others.

[1] All references are shown at end of paper.

At Pachuca, holes over 2,000 ft., of which there are 42, are considered "long," eight passed 3,000 ft.—the longest reaching 3,653 ft; while holes started within 20 deg. of the horizontal are considered horizontal, more correctly flat, holes. Long holes are planned to remain within a vertical range believed favorable for ore, and usually start inclined upward.

Geology of District is Complex

The Pachuca-Real del Monte district is located on the northeast mountain rim of the valley of Mexico. The chief rock is augite andesite, in massive flows, remarkably homogeneous in composition and appearance for more than 2,000 m. in thickness, and overlain in part by rhyolite and dacite flows. Near the city of Pachuca are minor post mineral flows of basalt. The two types of veins are confined to the andesite. The east-west occur both in Pachuca and Real del Monte, and dip south about 65 deg., occasionally flatter. The steep dipping north-south veins occur only in Real del Monte.

Drilling difficulties occur with quartz porphyry dikes, where bortz bits become too polished to cut, and with the east-west veins, which are more difficult to core than the north-south. The dikes strike east-west and are found in the andesite; while the east-west veins have gouge and altered wall rock resulting from post mineral movement.

Due to post mineral faulting and later erosion, some of the orebodies outcrop and have been mined from the surface since the 1530's, perhaps earlier. Other orebodies top as much as 200 m. below the present surface, and have generally been discovered and mined within the last 20 years; many were found by diamond drilling.

The vertical range of the orebodies varies from a maximum of 600 m.

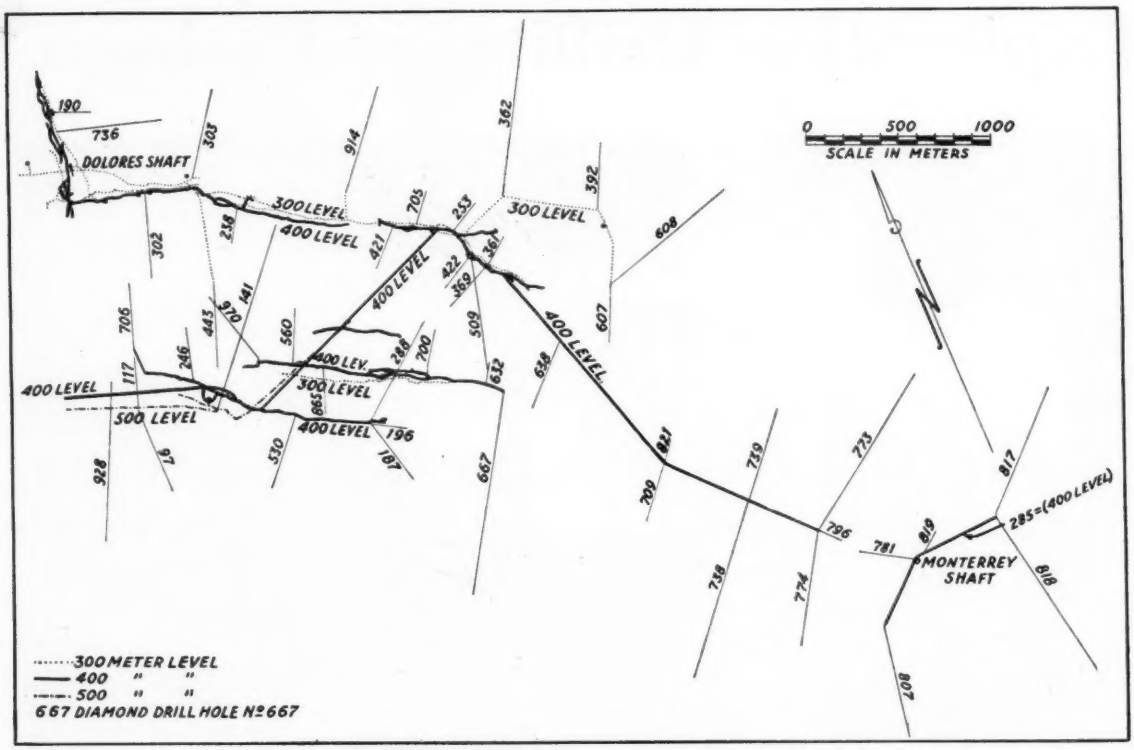


Fig. 1. Diamond Drill Holes southeast of Dolores Mine, Real del Monte

in the north-south veins to as little as 50 m. in the east-west. Both types of vein may contain from one to several ore shoots, which may vary from short irregular occurrences to orebodies of considerable length.

Silver occurs principally as argentite in a quartz gangue. Base sulphides, sphalerite, galena, and pyrite, are sometimes present, but not in commercial quantities. Drill holes have cut several veins at depths up to 370 m. below the bottom of the orebodies; the vein fracture has been recognized, but was barren in every case.

Objectives of Drilling Program

Formerly the only means of development was by long crosscuts from known veins. About twenty-five years ago a campaign of diamond drilling was started and gradually increased, as drillers became trained, until a peak of 13,939 m. was drilled in 1942. Naturally many holes gave negative information, but this has proved valuable and has eliminated more expensive work.

Unexplored areas have been divided into blocks of convenient size by drill holes, as shown in the accompanying sketch (Fig. 1) of the area east and south-east of Dolores Mine, where negative results explain the wide spacing between some holes.

In conjunction with other work, drill holes have been used:

1.—To examine areas between known veins; e.g., the blocks between the north-south veins have been drilled at intervals.

2.—To look for possible continuations of known veins, and for new ore shoots in unexamined parts of known veins. When known veins are cut above or below existing workings, such holes are not always "horizontal holes."

3.—To examine new areas which show some surface geological interest, e.g., quartz float, and new areas under post mineral surface flows which conceal possible vein outcrops. Many cases would not be examined at all except by drilling.

Advantages of Long Horizontal Holes

As shown in Fig. 2 an underground horizontal hole may examine more length of the favorable ore zone, and examine it more thoroughly, than several inclined holes from surface. Underground holes can usually be started in, or near, a favorable elevation, whereas surface holes often traverse a barren section. In Pachuca, surface holes started in rhyolite and basalt flows have invariably given serious trouble, and most, if not all, of them were abandoned before completion.

Organization for Drilling

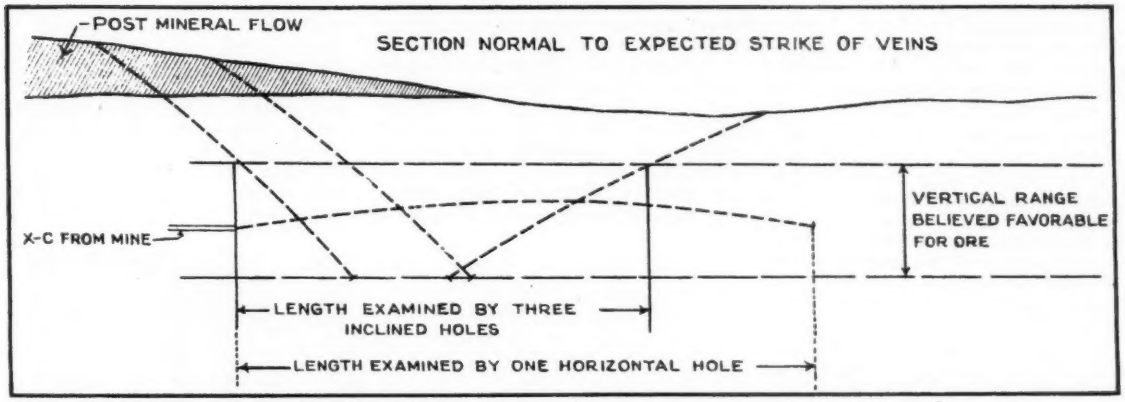
The accompanying chart (Fig. 3) shows the maximum size of the drill department; it has since been reduced. A runner and two helpers form a crew for the large machines, and a runner and one helper for the small drills. The latter are Mitchell No. 10E, C. P. No. 5, and Sullivan No. 6 machines, which drill EX holes up to 300 ft. long.

The early drill crews were trained by American runners, and in turn helped under American supervision, to train others. The most experienced men are employed on long holes; newer men are trained on short holes.

Long holes are usually worked on two shifts, occasionally on three. Until November, 1941, the men were paid daily wages; since then they have been guaranteed their wages, and share in the profits on a predetermined contract basis. Time lost while cementing, surveying, putting casing, etc., is paid at straight time. Weekly liquidations are made between all the crews working on the same hole.

Machines and Equipment

Most of the long holes were drilled by two Longyear No. 3 Steam drills, having screw feed swivel heads, and using compressed air; a few others by a Longyear Master Straitline machine, powered by two I-R air motors,


POST MINERAL FLOW
SECTION NORMAL TO EXPECTED STRIKE OF VEINS
VERTICAL RANGE BELIEVED FAVORABLE FOR ORE
X-C FROM MINE
LENGTH EXAMINED BY THREE INCLINED HOLES
LENGTH EXAMINED BY ONE HORIZONTAL HOLE

Sketch showing the advantage of long horizontal holes underground compared with inclined holes from the surface

each developing 18 hp. One hole, 2787 ft. long, was drilled by two Longyear No. 2 steam drills in tandem. The second machine had a bushing in place of the feed nut and only helped to rotate the rods. This arrangement placed more strain on the feed nut of the first machine, and required a longer station than usual, but was successful. The No. 2's usually drill holes up to 2,000 ft. long, occasionally up to 2,500 ft.

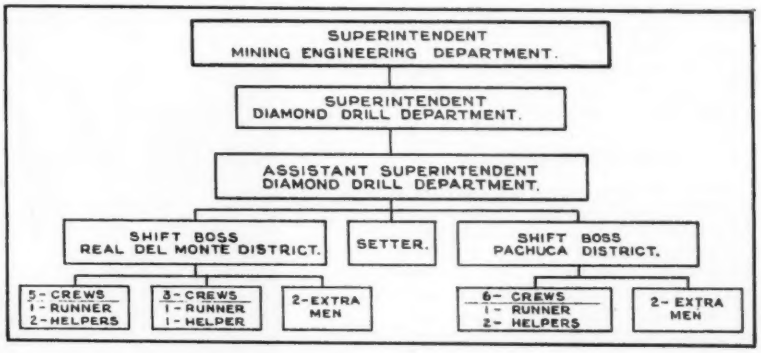
The No. 3's, now obsolete, proved very satisfactory; their principal disadvantage is the low spindle speed, about 400 rpm. which, while suitable for carbon bits, is too slow for ready set bortz bits. The longest hole in this area was stopped only because the crankshaft of the No. 3 engine broke; after being welded and replaced, the runner drilled 5 ft. more to fill the core barrel and to complete the hole to 3,653 ft.

Long holes are started BX casing, occasionally NX size, and pipe or casing is cemented in the collar to control water that might be cut. The first 1,500 to 2,000 ft. is drilled BX size with B rods, and the remainder AX size with B rods in the BX hole and A rods in the AX hole. Occasionally long holes in broken ground are cased with both AX and EX casing and finished EX. This is often cheaper than reaming and advancing the AX casing, but the E rods, and bent and worn rods of larger size, may fail under the heavy torque.

The rods are 10 ft. long, which is a disadvantage since the many couplings in a long hole require pressures up to 500 psi. to get water to the bit; 20-ft. rods were considered too difficult to handle underground.

Core Barrels Made in Shops

Double tube, rigid type, core barrels, made in Real del Monte shops, are used; lengths were 10 ft. before 1937, and 20 ft. since then. The 20-ft. barrels have three stellite rings at the ends and middle to reduce deflection. Each ring, which is nearly the size of the bit, has two water channels. With suitable reaming shells these barrels will take any type of standard bit; by changing the shell and inner tube, "thin faced" AXT bits can be used in the same outer tube as AX bits.


SUPERINTENDENT MINING ENGINEERING DEPARTMENT.
SUPERINTENDENT DIAMOND DRILL DEPARTMENT.
ASSISTANT SUPERINTENDENT DIAMOND DRILL DEPARTMENT.
SHIFT BOSS REAL DEL MONTE DISTRICT.
SETTER.
SHIFT BOSS PACHUCA DISTRICT.
5- CREWS 1- RUNNER 2- HELPERS
3- CREWS 1- RUNNER 1- HELPER
2- EXTRA MEN
6- CREWS 1- RUNNER 2- HELPERS
2- EXTRA MEN

The maximum organization of the drill department

With the equipment available, welding the middle stellite ring introduces an unavoidable bend in the barrel. When worn, the rings are rebuilt with stellite, but it is uneconomical to reweld the middle ring more than once, because a third bend makes the barrel wear too rapidly.

Straight wall bits are used in flat and up holes, and bevel bits, with core lifters, in down holes only. Hand set carbon bits were formerly employed exclusively; hand set bortz bits were introduced about 1933, and ready set bortz bits about 1936. Since then all three have been used. Virtually every type of ready set bit sold in Mexico has been tested; the most satisfactory were J. K. Smit bits and the pre-war Koebelite, without water channels and with evenly spaced inserts. Rapid wear occurs near water channels while the quality of bortz bits has deteriorated noticeably since the start of the war.

In broken silicified andesite, broken quartz, and some dikes, carbon bits are still the most economical. Stones purchased are from 3 to 3½ carats and gradually wear down to smaller sizes. Hand set bortz bits, with 8 to 10 stones to the carat, are used in good ground, and chips or bortz in reaming shells.

Gardner-Denver type EV reciprocating steam pumps, 7 in. x 2½ in. x 10-in., using compressed air, deliver water at up to 500 psi., although the normal working pressure is 350 psi. Occasionally a second pump is needed to supply water to storage tanks. Return water is used whenever possible, but it is often lost in deep holes and attempts to recover it are generally uneconomical, unless the hole is relatively shallow.

The Drill Station

Stations are made for a 30-ft. pull. A 40 ft. pull has been tried, but the rods are too heavy to handle conveniently and sag too much. Bending the rods while pulling them into the hole causes the chief rod troubles. To reduce bending by getting a straighter pull, the cable is wrapped around the rods in a spiral, which turns the rods to the right and unwinds when pulled; a helper steadies the end of the rods. This may be dangerous should the entering string hit a cave or other obstruction. Details of the

set-up are shown in the accompanying photographs.

The drill is well braced on the right of the station. By extensions on all valves the operator controls the machine from its left side.

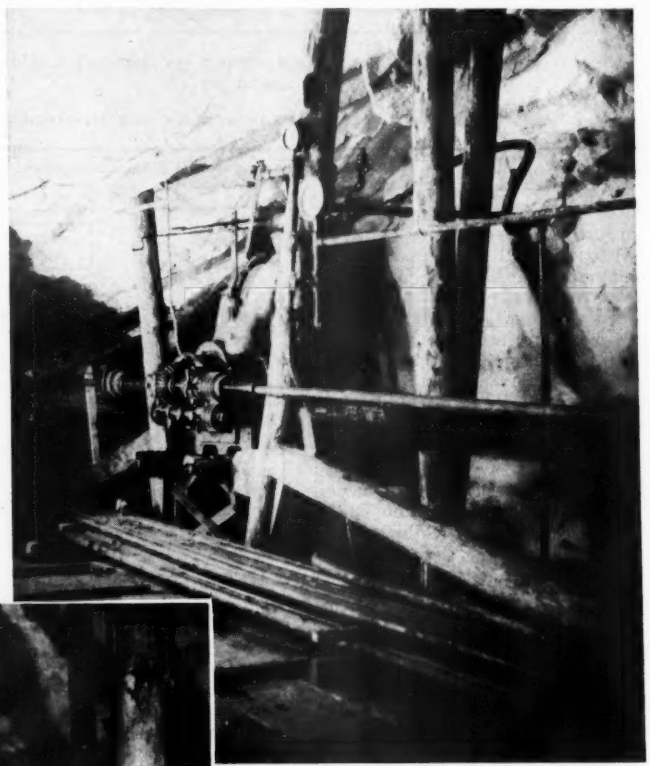
Long holes have cut high pressure water, hot water at 135 deg. F., and gas. A tee is fitted to a piece of 2½ in. pipe or BX casing cemented in the collar of the hole, so that any water cut may be piped off, or controlled by a valve, as desired, while drilling can be continued through a stuffing box. Larger pipe is used in those holes started in NX casing size.

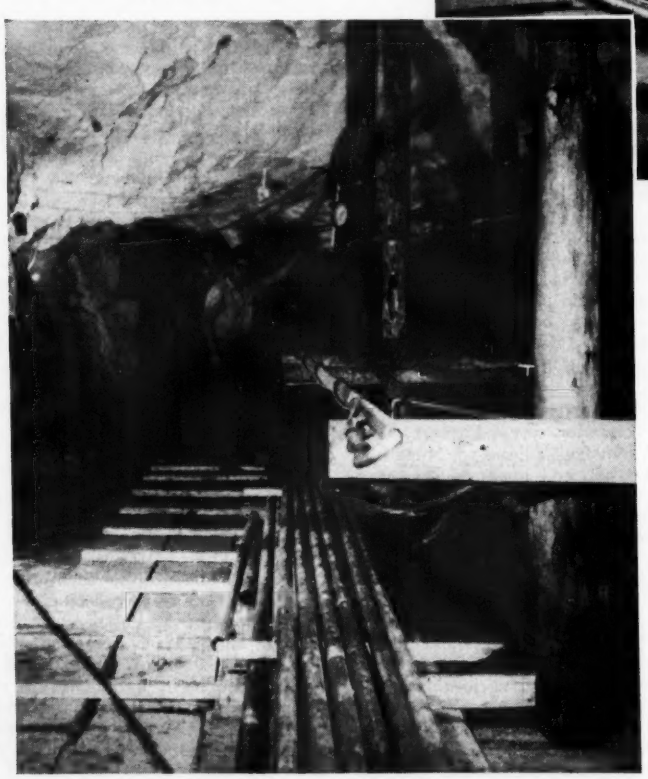
An inert gas flows from some fissures cut by development work and drill holes. It can cause fatal accidents, so a burning candle is kept in gassy stations. The flow of gas seems to vary with the atmospheric pressure. Gas has gone out of some holes during part of the day while air entered during other parts. Gassy workings are ventilated by blowers rather than by suction fans.

Operating Details

When drilling long holes, alcohol is run through the engine from a drop feed lubricator to prevent freezing of the exhaust, about a quart of alcohol being used per shift. This in turn causes lubrication trouble and more oil is used. With slow speed reciprocating engines the use of alcohol is not objectionable, but with high speed and rotary engines serious trouble may develop through faulty lubrication.

To reduce rod vibration caused by friction, a heavy axle grease with a tallow base is applied cold on the first 300 ft. or so of rods, and replaced as worn off. A 3,000 ft. hole requires about two short tons of grease, costing about 7c U.S. per foot. Molten rosin is added to the grease to make it stick to the rods if hot water is present. Hot water will remove the grease rapidly; in wet holes the rods should be dried before applying the grease. Sacking, used to apply the grease and to handle the rods, becomes a fire hazard, and must be removed from the mine at frequent intervals; upon completion of the hole, grease soaked timber must also be removed. To pull, disconnect, and stack 30 ft. of rods requires an average of one minute, but a good crew will normally better this.





Above: A set-up showing front sheave, extensions on control valve and timber holding the drill in place

Left: Looking from the tail room to the collar while pulling rods. Note spiral wrap of the hoisting cable around the rods

In long holes it is more difficult to tell when the bit is blocked, before pulling core, than in short holes. It also takes 15 to 20 minutes for the water to reach the bit, which may get muddied, or even burned, if the operator starts drilling too soon.

Quick Acting Cements Used

Lumnite quick setting cement is used to recover return water in the early part of long holes, and to continue the hole through caving ground without casing. In hot water and hot rocks this cement often sets before it can be put in place so either a Portland cement, or a mixture of

Portland and Lumnite, is substituted. Iced water has proved an economical and effective way to retard setting of Lumnite cement, but is inconvenient.

For flat and up holes the wet cement is put into cartridges, about 5 ft. long made of heavy paper. They are usually cut in half, put in the core barrel, pushed to the required part of the hole, and blown out with compressed air. The rods are withdrawn, a wooden plug the size of the hole put on the end of the core barrel, and the rods run in again to tamp the cement into place. An open fissure may require several feet of cartridges to fill it. If the hole is around 2,000 ft. long, the Lumnite cement is apt to take its first set before the rods can be returned to tamp it.

Liquid cement is pumped in occasionally, as is usual in down holes, but the rods must be thoroughly washed, and care taken to avoid cementing them in the hole. Cementing is very difficult, if not impossible, against a heavy flow of water, and even more so against hot water.

Casing is used in caving ground that does not cement well, and to prevent bad ground in the shallow part of a hole from causing trouble later, as well as to try to shut off ground water. Casing is not brought to the collar, as in down holes; only enough is placed to get through the cave. The first piece of casing is set at the end with bortz, and is run in dry for a short distance to make good contact with the rock. The last piece has two opposite slots into which fit lugs on the end drill rod. Once the casing is placed, the lugs slip out of the slots as the rods are pulled. When the hole is finished, the casing is pulled with a spear tap; some casing is often lost. To prevent uncoupling, hot rosin is applied to the threads of all casing joints. The rosin does not harden sufficiently in hot water and is then mixed with some cement. Spot welding has been considered for holes making much hot water, but was never tried.

Deflecting Procedure

After a vein has been cut, a second sample is often taken by deflecting the hole. The exact location of the vein being known, greater care can be given to recovering core by making short runs and frequent pulls.

A soft pine plug is cemented some 60 ft. from the vein, and allowed to swell to a tight fit. The soft steel, semi-circular wedge, is fastened to the lowering plug by two copper rivets. A spike on the end of the wedge is jammed into the wooden plugs, the rivets are severed by a sharp blow, the lowering plug withdrawn, and the wedge cemented in place. Drilling is started with a rounded bit, made locally, which cuts a small core, followed by a normal bit after the wedge has been passed. The wedge tapers from ⅛ in. to the diameter of the hole in a length of 7 ft. A swell coupling set with bortz is put in the string of rods and kept as near as possible to the point of defection. This enlarges the hole so the rods pass the wedge more easily and with less strain. Satisfactory deflections have been made up to 660 m. from the collar (2,165 ft.).

Chalk marks on the rods can be used with plumb lines to try to deflect the hole in a given direction. Holes which have dropped an abnormal amount have been deflected upwards to try and keep the hole straight; but this has not been entirely successful.

All Long Holes are Surveyed

Holes were formerly surveyed for horizontal deflection by the Mass compass. This was discontinued about 1930 because this deflection was found to be small.

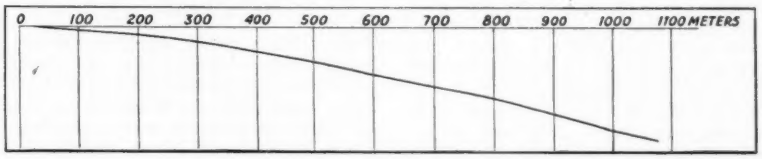
All long holes are surveyed for vertical deflection by the hydrofluoric acid, etched tube method. Using suitable couplings, two readings can be taken simultaneously 50 m. apart. The mixture is one part of 52 per cent acid to two parts of water, with one hour exposure. Etchings at the bottom of long holes tend to be faint, but a skilled runner can usually get good readings.

Published curves being found unreliable, capillarity is corrected from a prepared curve. Readings were taken at 5 deg. intervals between the horizontal and the vertical using the same tubes, acid strength, and time of exposure, as used underground.

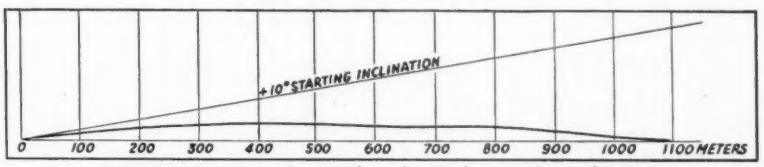
With the exceptions noted later, diamond drill holes in the Pachuca-Real del Monte area drop downward. The amount of this vertical deflection is independent of the starting inclination of the hole. That is, on the average, flat holes drop as much as inclined holes. Individual holes may behave erratically and although their course cannot be foretold exactly, the probable course can be forecast with some confidence. However, one can be fooled by holes which, for no apparent reason, do not follow the average.

The average drop per 100 m. of hole is 2.9 deg. for the 10 ft. barrels and 1.5 deg. for the 20's. However, holes drilled with 20-ft. barrels are much more erratic; some have even turned upward. A possible explanation of these greater irregularities may be the contract system, introduced in November 1941, which gave the runners more incentive to increase the pressure on the bit so as to drill more footage.

Using 10-ft. core barrels, deviations at 600 m. (approximately 2,000 ft.) showed a variation for 18 holes between —7.00 deg. and —23.27 deg. At 700 m., deviations for 8 holes varied between —12.00 deg. and —30.13 deg. At 800 m. the record on 4 holes showed deflections between —17.25 deg. and —23.25 deg. Only one hole has been recorded beyond 1,000 m. using the 10-ft. barrel and at a distance of 1,075 m., the final survey showed a deflection of —27.25 deg.



4-A. Average survey of 23 long horizontal holes drilled with 20-ft. core barrels, swung to zero inclination at the collar



4-B. Same curve as above with a plus 10 deg. starting inclination

The record using 20-ft. core barrels shows less over all deflection although, as previously stated, individual holes proved to be more erratic. The record for 23 holes at 600 m. shows deflection variations between 0 and —23.50 deg. At 800 m. the deflections on 11 holes showed variations from —0.50 deg. to —22.75 deg. Four holes reached a length of 1,000 m. and these showed deflections from —12.00 deg. to —18.50 deg. The longest hole that was drilled reached 1,100 m. and the survey at the bottom showed —10.17 deg.

The average survey curve using 20-ft. core barrels, is plotted in Fig. 4A. Fig. 4B shows the same curve starting at plus 10 deg., which is the more usual case.

Planning of long holes is facilitated by using a plastic curve, cut to a deflection of 2 deg. per 100 m., from

which the starting inclination required to reach a given point is scaled by protractor. Holes are planned to stay within the vertical range considered favorable for ore by the geologists. The deflection of the plastic curve, 2 deg. per 100 m., was based on data taken several years ago.

Difficulties and Dangers

Trouble has often developed when a fault is crossed at an oblique angle, even when the hole has advanced well beyond the fault. The gouge usually makes a big opening where sooner or later the rods break, or the hole deflects itself. Cementing in heavy gouge is not always satisfactory. The best remedy is to case the hole from one side of the fault to the other; this is difficult if the hanging wall is broken, and it also reduces the size of the hole and hence the chance of reaching great length, especially if the fault is cut early in the hole. Some times unusual ground must be cemented all the way to prevent caves developing later.

In addition to safety considerations already mentioned, potential danger points are the hoisting cables, gears and chuck bolts, and the turning of rods with wrenchs. Roebling blue center steel cables 6 x 19 are used, the sizes being employed are ½ in. for about 2,000 ft. of hole, then ⅝-in. Unlike down holes, flat holes do not require left lay cables; either left or right lay is satisfactory. The small diameter drums on the drill hoist are hard on cables, which must be inspected regularly, since 1,500 ft. of B plus 1,500 ft. of A rods weigh about 6 short tons. While rods are not lost should the cable break, there is some danger to the men.

Real del Monte has put guards on all feed gears, but the men object to the delay in removing them to change gears, and may discard the guards. Several fingers have been lost as a result. Chuck bolts must be countersunk to prevent the projecting head from catching in the men's clothing. Chucks repaired in the shops are occasionally returned with protruding bolt heads which have caused accidents.

With the rods in heavy ground, the engine may fail to start; then wrenches are used to turn the rods by hand until the engine turns over. The rods wind up like a long clock spring and, if released, will throw the wrenches back suddenly. This has caused one fatality on a short surface hole, and several minor accidents. Before resorting to wrenches the rods are pulled back and another attempt made to start the engine.

Core and Sludge Samples

Core, taken to surface in containers made from cyanide cans, is transferred to 5-ft. wooden boxes for thorough inspection and sampling by the geological department, after which the boxes are racked. In all, nearly 100 miles of drill core are kept available for inspection; this has proved most useful on many occasions. Samples are cut with a Longyear core splitter, half the core being sent for assay and half retained for reference. Important showings are resampled by taking half the remaining core for assay, leaving one quarter of the original core for reference.

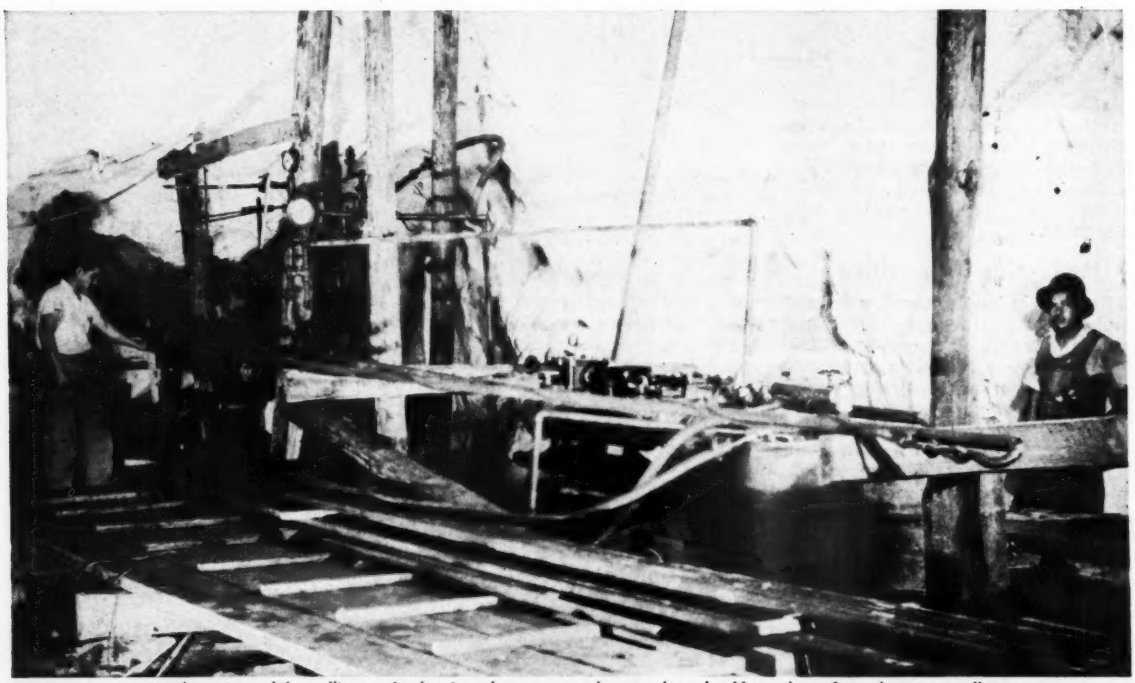
Sludge samples are obtained from settling tanks into which the return water is run; return water is recovered whenever economically possible.. These samples are not very reliable, but have occasionally proved important when drilling gougy east-west veins. Some sludge samples may have concentrated, by gravity or even flotation, before reaching the collar.

Speed of Drilling

Within practical limits speed of drilling has been a secondary to core recovery. Drilling a 1,000-m. hole, working two shifts, takes from 7 to 8 months, including setting up and tearing down, and lost time for all causes. Some holes require less time and others more. The advance per month is about as follows:

Month	Advance m.	Total length m.
1st	180	180 *
2nd	150	330
3rd	150	480
4th	110	590
5th	110	700
6th	110	810
7th	110	920
8th	80	1,000 †

* Includes setting up.
† Includes tearing down.



Another view while pulling rods showing the pump and water barrel. Note the safety cleats on walkway

Summary of Long Hole Drilling

From 1922 to 1946, inclusive, 42 long horizontal holes were drilled at an average cost of under $10 United States per meter, or less than 1 cent United States per ton milled during this period. Of these holes, 7 found showings that justified examination by routine development, while 2 cut minor showings that did not merit further work. In the 7 cases, subsequent work found one major orebody and 4 of lesser importance, while 2 cases failed to find ore. The orebodies subsequently discovered are roughly estimated at a million and a quarter tons.

The 33 holes that gave negative results were not wasted; they helped to take care of lease and assessment work obligations, and examined a large area of country that might never have been tested at all; while in several cases they ruled out more expensive development.

Short holes, not considered in this article, probably helped to find more ore, but could not prospect the margins of the properties as did the long holes.

Limit for Horizontal Holes

With the equipment described, horizontal holes can probably be drilled a little farther than the present maximum. Several proposed long holes were abandoned before reaching 2,000 ft. for one or more of the following reasons:

1. Hole too expensive, due to unexpected difficulties, e.g., bad ground, water, etc.
2. Hole dropped below the favorable ore horizon.
3. Hole self deflected, or rods broke, or bit stuck and could not be recovered.

Improvements in equipment are possible. If a drill rod of sufficient strength and durability, and weighing say 75 per cent of those now used were obtainable, the rod load at 3,000 ft. would be reduced from around 6 tons to 4.5 tons, thus decreasing the load on the engine and cable. Such a rod would permit a 40-ft. pull instead of 30-ft., saving considerable time and reopening the question of using 20-ft. rods. Bending of the rods when pulling in would remain a problem to solve.

Rods used on long holes are moved in and out of the mine only occasionally so 20-ft. rods, even of the present weight, might be feasible in some cases. If combined with the 10's for a 30-ft. pull, the number of couplings in 3,000 ft. would be reduced from 300 to 200. Using lighter 20-ft. rods, if available, and a 40-ft. pull would mean only 150 couplings. Either way would reduce the high water pressure now required or permit a longer hole with the same pressure.

New types of core barrel,[5, 6] which cut the water off when the core is blocked, are now available. With this safeguard possibly long barrels might be used, at least in good ground, although this might complicate the deflection problem.[7]

Air operated drills have not proved satisfactory on these operations as they are cumbersome to move about the mine and they consume in excess of 600 cu. ft. of air per minute. Electric power is not always available underground, but it would seem to offer several advantages. Higher speed drills than the No. 3's have obvious advantages, if the crews are trained to utilize them, but the most suitable speed may be lower in horizontal holes than in vertical, or steeply inclined holes, because of rod friction.

Bits are obviously not as efficient as they could be.

Some eight years ago Real del Monte investigated the possibility of drilling a horizontal hole in excess of 4,000 ft. The project was never carried out. Since then the greater experience gained in Pachuca suggests that such a hole is quite feasible in good ground if the hole has an average drop. Preliminary tests to find a cement mixture that does not set too soon would be desirable, especially if high rock temperatures were expected.

Acknowledgments

Credit for the success of the long hole drilling is divided among many individuals, from the far-sighted management which originated and pushed the program, the engineers who planned each hole, the foremen who were in daily contact with the problems involved, to the Mexican crews behind the drills, who carried out their duties in an exemplary manner.

The work of the late W. Seineke, drill foreman until his death in 1942, who trained the first crews, and of T. E. Harrington, who supervised most of the long holes drilled since 1931, is especially noteworthy.

The writer is indebted to Mr. Harrington for assistance in preparing these notes, and to Mr. J. G. Reilly, managing director of Compañia de Real del Monte y Pachuca, for permission to publish them.

References

1. Representatives of E. J. Longyear Co. and the Sullivan Machinery Co. have stated informally that R.d.M. has drilled the longest horizontal diamond drill holes known to them.
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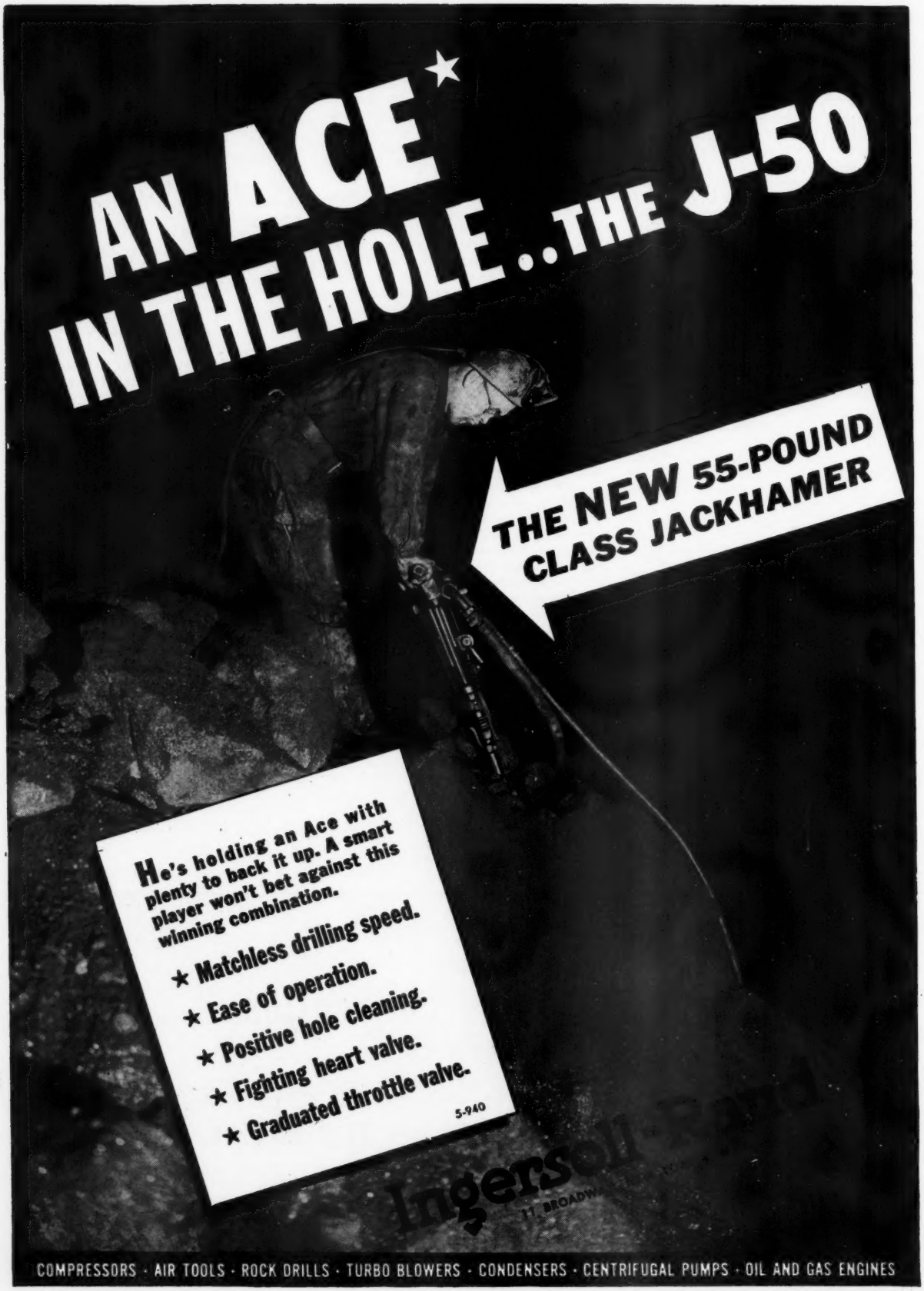
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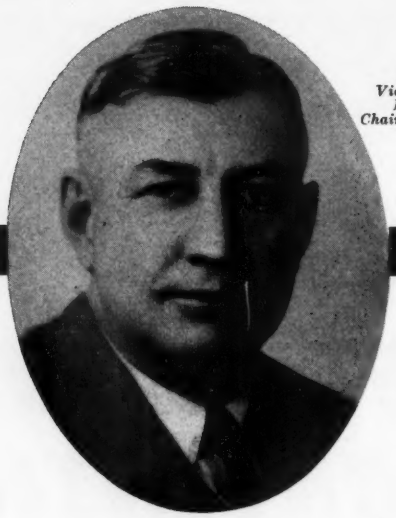

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El Paso To Greet Metal Miners

FOR the first time in 17 years, the American Mining Congress is holding its Metal Mining Convention in El Paso, Tex. In this colorful city, located in a region famous to southwestern history since the days of the conquistadores and early Spanish padres, mining men will gather from throughout the nation to discuss the problems that lie ahead for the mining industry.

The host to this meeting will be El Paso's famous International Mining Days' celebration, an annual event that has done much to cement the friendship among mining men on both sides of the border. This year the convention will be honored by the presence of many outstanding officials and mining men from Mexico, some of whom will participate in the program and share in the festivities.

The convention program, which has been developed by an industry-wide committee under the able chairmanship of Donald H. McLaughlin, is oriented towards the removal of governmental restrictions that have deterred new mining enterprise. Since our national defense policy must be closely integrated with the development of future ore reserves and the maintaining of a strong and progressive mining industry, speakers have been selected from within the industry and from Government who are in a position to discuss the mining industry's requirements as well as public policies bearing upon such important topics as taxation, tariffs, stockpiling, labor relations, public lands, and postwar mineral programs of the U. S. Government.

Manpower problems will receive special attention, with emphasis on means of recruiting and training good miners as well as on mechanization and improved mining methods for greater productivity. Progress and latest developments in underground and open-pit mining practice, in milling methods, in geophysical exploration and in safety will receive full attention.

Headline speakers will include: the Honorable J. A. Krug, Secretary of the Interior; Sr. Lic. Don Ramon Beteta, Secretario de Haciendo y Credito Publico, Republic of Mexico; Hon. Fred A. Hartley, Chairman of the Committee on Education and Labor of the U. S. House of Representatives; Sr. Senador Don Antonio J. Bermudez, Director General of Petroleos Mexicanos; Dr. James Boyd, Director, U. S. Bureau of Mines; and Sr. Ing. Don Gustavo P. Serrano, President, Mexican Chamber of Mines.

A welcoming luncheon at the Scottish Rite

Auditorium will feature the first day of the meeting. The Chairman of the Program Committee, Donald H. McLaughlin, will preside. The Honorable Beauford H. Jester, Governor of Texas, and the Honorable Dan Ponder, Mayor of El Paso, will welcome the visitors to the convention while responses will be made by Howard I. Young, President of the American Mining Congress; H. M. Lavender, Chairman of the Western Division of the AMC; Thomas McNally, Chairman of the Manufacturers' Division, AMC; and E. McL. Tittmann, Chairman of the International Mining Days' Celebration. The guest speakers will be Sr. Lic. Don Ramon Beteta and the Honorable J. A. Krug.

JULIAN D. CONOVER
Secretary
American Mining Congress

The convention program will contain five general and two operating sessions. These will start on Monday morning, October 27, and end at noon Wednesday; the last afternoon will remain open to allow for group discussions on special subjects and general visiting. One innovation that will enhance the attractiveness of the program is that of opening each session with a short moving picture. Selected new films from the library of the U. S. Bureau of Mines and movies contributed by important mining companies will feature each program.

The future problems of

(*Continued on page 34*)

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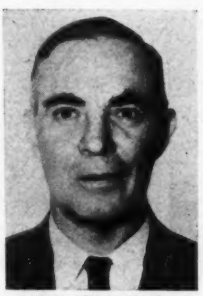

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(Continued from page 31)

metal mining will keynote the first session. Topics to be discussed are: the postwar mineral program of the U. S. Government; geophysical prospecting, the possible key to future mineral discovery; and the best means of fostering a strong domestic mining industry. The afternoon session this same day will feature mining in Mexico and problems of gold and silver. The third general session, which opens Tuesday morning, will be devoted to labor legislation and labor relations. The Taft-Hartley Act and its relation to the mining industry will be thoroughly analyzed and there will also be discussion of further requirements necessary to a sound code of labor law. The Tuesday afternoon session will be devoted to manpower and mechanization. Recruiting, training and safety programs will be reviewed at this time, and two well known authorities on mine mechanization will discuss improved mechanization and mining methods for greater productivity and lower costs. The final general session on Wednesday morning will review problems of the small mine operator, postwar problems of Federation taxation, and the position of our domestic potash industry which is threatened by restrictive land policies.

Two special operating sessions will bring out new developments in mining and milling. Some of the topics for presentation are: progress in fusion drilling; the application of hard materials to rock-cutting bits; improvements in trackless

Metal Mining Directors

AMERICAN MINING CONGRESS

(Not Shown)
NEIL W. RICE

mining; engineering and development problems at the Morenci open pit; the present status and potentialities of the heavy-media process; a review of milling progress; and carbon-cyanide treatment of gold ores.

The Southwest is famous for its hospitality and good fellowship. The proximity of Juarez with its gay night life and famous eating places is a certain guarantee of a successful social gathering and the visiting ladies will have ample opportunity for purchases in the many picturesque Mexican shops across the Rio Grande.

An informal "Sourdough Supper" is scheduled for Monday night at the El Paso Country Club, with cocktails, entertainment and dancing. A fine Mexican dinner will be served and those who like their tortillas and enchiladas can try to bribe the waiters for a second helping. Tuesday evening will be open for informal gatherings and visits to Juarez.

The program will wind up with the Annual Banquet on Wednesday night. Harrison M. Lavender, Chairman of the Western Division of the American Mining Congress, will be the toastmaster. The speakers for the evening will be Major General "Terrible" Terry Allen (Ret'd), whose subject will be "Preparedness Needs of Today and Mining's Role in National Defense," and the Honorable James D. Arrington of Collins, Miss., known as the "homespun philosopher" who will present an inspiring message on the American free enterprise system.

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SR. LIC. RAMON BETETA

MAJ. GEN. TERRY ALLEN

JAMES D. ARRINGTON

PROGRAM

Monday, October 27
Morning Session

Pre-Session Motion Picture—"A Story of Texas and Its Natural Resources"

FIRST GENERAL SESSION—FUTURE OF THE MINING INDUSTRY

Opening of Convention

JULIAN D. CONOVER, Secretary, American Mining Congress.

Chairman:

WORTHEN BRADLEY, President, Bradley Mining Co.; President, California Chapter, American Mining Congress.

Postwar Mineral Programs of the U. S. Government

JAMES BOYD, Director, U. S. Bureau of Mines.

The Future of Geophysical Prospecting

H. R. JOESTING, Chief, Geophysics Section, U. S. Geological Survey.

Discussion: Possible Changes in the Mining Law to Encourage the Search for Hidden Ore Deposits

ROBERT M. SEARLS, Atty.-at-Law, San Francisco, Calif.

Fostering a Strong Domestic Mining Industry

OTTO HERRES, Vice President, Combined Metals Reduction Co.

Discussion

B. T. POXSON, Chairman, Emperius Mining Co.; President, Colorado Mining Assn.

Welcoming Luncheon

Presiding:

HOWARD I. YOUNG, Pres., American Zinc, Lead & Smelting Co.; Pres., American Mining Congress.

Welcome to Texas

HON. DAN PONDER, Mayor of El Paso.
HON. BEAUFORD H. JESTER, Governor of Texas.

Responses

H. M. LAVENDER, Chairman, Western Division, American Mining Congress.
DONALD H. MCLAUGHLIN, National Chairman, Program Committee.
THOMAS MCNALLY, Chairman, Manufacturers Division, American Mining Congress.
E. MCL. TITTMANN, Chairman, International Mining Days Celebration.

Guest Speakers

SR. LIC. RAMON BETETA, Secretario de Hacienda y Credito Publico, Republic of Mexico.
Hon. J. A. KRUG, Secretary, U. S. Department of the Interior.

Afternoon Session

SECOND GENERAL SESSION—MINING IN MEXICO; GOLD AND SILVER

Chairman:

DONALD H. MCLAUGHLIN, President, Homestake Mining Co.; National Chairman, Program Committee.

Mining Conditions in Mexico

SR. ING. GUSTAVO P. SERRANO, President, Chamber of Mines of Mexico.
SR. SENADOR ANTONIO J. BERMUDEZ, Director General, Petroleos Mexicanos.

The Future of Gold

ARTHUR NOTMAN, Cons. Engr., New York, N. Y.

Silver's Contribution to Western Mining

TOM LYON, Assistant to Manager, International Smelting & Refining Co.

MEXICO—A colorful motion picture presenting scenes from Mexico City, Cuernavaca, Taxco and Acapulco.

Evening

"Sourdough Supper," El Paso Country Club—cocktails, Mexican food at its best, dancing and entertainment.

Tuesday, October 28
Morning Sessions

Pre-Session Motion Picture—"The Drama of Steel"

THIRD GENERAL SESSION—LABOR LEGISLATION AND LABOR RELATIONS

Chairman:

F. S. MULOCK, Vice Pres. & Gen. Mgr., U. S. Smelting Refining & Mining Co.

Significant Features of the Taft-Hartley Act in Relation to the Mining Industry

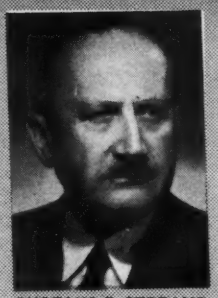
CHARLES R. KUZELL, Asst. Gen. Mgr., Phelps Dodge Corp., and
FRANK J. RYLEY, Atty.-at-Law, Phoenix, Ariz.

What Further Is Needed in a Sound Code of Labor Law?

HON. FRED A. HARTLEY, Chairman, Committee on Education and Labor, U. S. House of Representatives.

Discussion

KENNETH C. KELLAR, Atty.-at-Law, Lead, S. Dak.
ROY H. GLOVER, Western General Counsel, Anaconda Copper Mining Co.
E. H. SNYDER, Pres., Combined Metals Reduction Co.
F. O. DAVIS, Treas., Potash Co. of America.
ROY HATCH, Dir. of Labor Relations, Utah Copper Div., Kennecott Copper Corp.


GUSTAVO P. SERRANO

ANTONIO J. BERMUDEZ

HON. FRED A. HARTLEY

JAMES BOYD

Pre-Session Motion Picture—"This Is Aluminum"

FIRST OPERATING SESSION—DEVELOPMENTS IN MILLING

Chairman:

MAX W. BOWEN, Vice Pres., Golden Cycle Corp.

Present Status and Potentialities of the Heavy-Media Process

G. B. WALKER, Mineral Dressing Laboratory, American Cyanamid Co.

Progress and New Developments in Milling Practice

GEORGE H. ROSEVEARE, Metallurgist, Arizona Bureau of Mines.

Carbon-Cyanide Treatment of Gold Ores

ROY A. HARDY, Cons. Engr., Getchell Mine, Inc.

Afternoon Session

Pre-Session Motion Picture—"A Story of Copper"

FOURTH GENERAL SESSION—MANPOWER AND MECHANIZATION

Chairman:

E. S. McGlone, Vice Pres., Anaconda Copper Mining Co.

Recruiting Programs

H. C. LIVINGSTON, Vice President, Charge of Operations, Union Pacific Coal Co.

Training and Safety Programs

LESTER F. BISHOP, Production Foreman, Anaconda Copper Mining Co.

Mechanization for Greater Productivity and Lower Costs—(A review of Progress and Potentialities)

L. E. YOUNG, Mining Engineer, Pittsburgh, Pa.

Improved Mining Methods for Greater Productivity and Lower Costs

R. W. JENKINS, Sullivan Div., Joy Manufacturing Co.

Evening

Open. No scheduled entertainment. Night spots of Juarez will have their innings.

Wednesday, October 29

Morning Sessions

Pre-Session Motion Picture—"Sulphur"

FIFTH GENERAL SESSION—INDUSTRY PROBLEMS

Chairman:

ROSS D. LEISK, Gen. Mgr., Sunshine Mining Co.

Problems of the Small Mine Operators

CHARLES F. WILLIS, State Secretary, Arizona Small Mine Operators Association.

Problems of the Domestic Potash Mining Industry

(A former "have not" mineral in which the U. S. has attained self-sufficiency—future development threatened by restrictive land policies)

HORACE M. ALBRIGHT, President, U. S. Potash Co.

Mining's Postwar Problems in Federal Taxation

HENRY B. FERNALD, Loomis, Suffern & Fernald; Chairman, A. M. C. Tax Committee.

Report of Resolutions Committee

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Pre-Session Motion Picture—"Tin From Bolivia"

SECOND OPERATING SESSION—MINING PROGRESS

Chairman:

HORACE MOSES, Gen. Mgr., Chino Mines Div., Kennecott Copper Corp.

The Application of Hard Materials for Rock Cutting Bits

R. W. ADAMSON, Jack Bit Div., Ingersoll-Rand Co.

Discussion:

PHILIP M. MCKENNA, President, Kennametal Inc.

Progress in Fusion Drilling

Speaker to be announced.

Engineering and Development Problems at Morenci Open Pit

W. C. LAWSON, General Supt., Morenci Branch, Phelph Dodge Corp.

Discussion: Handling Overburden with Large Trucks at Ruth and Kimberly, Nevada

WALTER S. LARSH, General Manager, Nevada Mines Div., Kennecott Copper Corp., and

PAUL J. SIRKEGIAN, General Supt., Consolidated Copper Mines Corp.

Afternoon

Tax Conference

Chairman:

H. B. FERNALD, Chairman, AMC Tax Committee

Conference on Strategic Metals Problems

Chairman:

S. H. WILLISTON, Vice Pres., Cordero Mining Co.

Other informal group meetings, for round table discussion of particular subjects, may be arranged as desired.

Evening

ANNUAL BANQUET

Toastmaster

HARRISON M. LAVENDER, Vice President and General Manager, Phelps Dodge Corp.; Chairman, Western Division, American Mining Congress.

Guest Speakers

MAJOR GENERAL TERRY ALLEN, U. S. A. (Retired)

HON. JAMES D. ARRINGTON, Collins, Miss.

nearby points of interest will be made if enough of those attending the convention desire to participate. A one-day bus trip can be made to Carlsbad, N. Mex., to inspect either potash mining and refining operations or the famous Carlsbad Caverns, and another possible trip is to Chino and Hurley, N. Mex., to see the great open-pit mine and the mill of Chino Mines Division of Kennecott Copper Corp. Arrangements for these trips can be made in El Paso and details will be available at the registration desk.

A view near El Paso, with Franklin Mountains in the background

WESTERN DIVISION

THE AMERICAN MINING CONGRESS

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Vice Pres. and Gen. Mgr., Phelps Dodge Corp.

Board of Governors

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P. R. BRADLEY, Chairman of the Board, Alaska Juneau Gold Mining Co.

WORTHEN BRADLEY, Pres., Bradley Mining Co.

WILLIAM C. BROWNING, Western Representative, Gold Fields American Development Co.

FRED O. DAVIS, Treas., Potash Company of America.

HENRY L. DAY, Pres., Day Mines, Inc.

ROY B. EARLING, Vice Pres. and Gen. Mgr. of Operations, Fairbanks Dept., U. S. Smelting Refining and Mining Co.

WRAY D. FARMIN, Pres., Northwest Mining Assn.

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ROBERT W. HUGHES, Gen. Mgr., Miami Copper Co.

PAUL H. HUNT, Vice Pres. and Gen. Mgr., Park Utah Consolidated Mines Co.

J. C. KINNEAR, Vice Pres. in Chg. of Western Operations, Kennecott Copper Corp.

PERCY H. KITTLE, Pres., Ohio Copper Co. of Utah.

HARRY W. MARSH, Secy., Idaho Mining Assn.

E. S. McGLONE, Vice Pres., Anaconda Copper Mining Co.

HORACE MOSES, Gen. Mgr., Chino Mines Div., Kennecott Copper Corp.

CHARLES A. NEAL, Atlas Milling Co.

ROBERT S. PALMER, Secy., Colorado Mining Assn.

IRVING RAND, Vice Pres. and Secy., Oregon Mining Assn.

JAMES K. RICHARDSON, Mgr., Utah Mining Assn.

HENRY M. RIVES, Secy., Nevada Mine Operators Assn.

A. H. SHOEMAKER, Mgr., Triumph Mining Co.

S. R. SMITH, Pres., Bonanza Mines, Inc.

HARVEY L. TEDROW, Vice Pres. and Gen. Mgr., El Paso Mines, Inc.

FRANCIS A. THOMSON, Pres., Montana School of Mines.

CARL J. TRAUERMAN, Secy.-Treas., Mining Association of Montana

H. E. TREICHLER, Gen. Mgr., Texas Gulf Sulphur Co.

F. C. van DEINSE, Vice Pres.-Gen. Mgr., Yuba Consolidated Gold Fields.

FRANK WAGNER, Gen. Supt., Knob Hill Mines, Inc.

G. H. WATERMAN, Pres., Manufacturers Mineral Co.

CHARLES F. WILLIS, State Secy., Arizona Small Mine Operators Assn.

S. H. WILLISTON, Vice Pres., Cordero Mining Co.

IRA L. WRIGHT, Gen. Mgr., Black Hawk Cons. Mines Co.

RICHARD A. YOUNG, Vice Pres., American Zinc Co. of Illinois.

Staff officials of J. & L. Steel Corp. inspect the underground workings

Modernizing to Increase Coal Production

Full Seam Mining and a New Preparation Plant Are Designed for a Record Tonnage at the Vesta Properties of the Jones & Laughlin Steel Corporation.

By GLENN B. SOUTHWARD
Mechanization Engineer
American Mining Congress

A RECONSTRUCTION program of first magnitude, whose total cost will run well into eight figures, is under way at the Vesta coal properties of the Jones & Laughlin Steel Corporation in southwestern Pennsylvania. This is strictly a post-war project which was started in the latter part of 1945 and is scheduled for completion in 1949.

Its purpose is to centralize the entire coal production of the Vesta Division into one operation and, contemplating a productive life of 40 years, its scope covers a complete modernization of the property. The major features of the program will include changing the underground method from "selective" to "full seam mining," rehabilitating the underground haulage, providing adequate facilities for equipment maintenance and constructing a coal cleaning plant that will prepare 18,000 tons of metallurgical fuel per day. This means 18,000 tons of cleaned coal and as the rejects will be about 33 per cent, the total material handled per day at this operation will be in the neighborhood of 27,000 tons. Such a tonnage—produced in two shifts—will qualify Vesta as a contender for first-place honors as the largest coal mine.

Plans for Centralization

This operation, working the Pittsburgh seam, is located in the famous Connellsville region of Pennsylvania, near Brownsville, on the Monongahela River and has both rail and water transportation to the plants of the Jones & Laughlin Steel Corporation. The history of the property covers a period of almost 60 years, starting in the early 1890's with the opening of Nos. 1, 2 and 3 Mines and continuing as other developments followed in due course. As time went on, certain boundaries were mined out; mechanization replaced the extended workings of hand loading and concentrated the mining into smaller areas until today there are only two main operations—No. 4 at California and No. 5 at Fredericktown. Further concentration as now planned will centralize the entire production from this division at No. 5. All the foregoing is shown on the accompanying regional map.

It goes without saying that to mine, transport and prepare the proposed tonnage, all underground and surface facilities must be designed, installed

and operated according to the best ideas that have been developed for mechanical mining. It also goes without saying that the J and L engineering and operating staffs, being experienced in mechanization, are fully conversant with the latest developments and their planning has incorporated the most modern technique. Accepting as a fundamental that all operations from the face to the barges must be in balance, and that no one phase can afford to be slighted, the rehabilitation work has been divided into four main classifications, each receiving equal consideration as enumerated below:

1. Mining, which includes all the panel operations from the face to the main line haulage.
2. Transportation, which includes hauling coal from the working sections to the slope bottom—over considerable distances as the map shows and also includes handling supplies from the outside in to the working section.
3. Maintenance of machines and equipment, which includes minor repairs and inspections at the working sections, larger repairs in the underground shops and major repairs in the main central outside shop.
4. Coal preparation, which includes conveying the coal from the mine car dump at the bottom of the slope, to the surface preparation plant where the product will be cleaned, sized and loaded into river barges. In this classification is the handling of refuse which, at maximum production, will amount to nearly 9,000 tons of material each 24 hours.

Full Seam Mining

This large amount of reject will be the result of "full seam mining" which is to be an integral part of the new plan and the basis on which all of the other operations are designed. A description of the seam characteristics, the present method of handling the drawslate with selective mining, and the advantages of full seam mining were very clearly described by E. R. Cooper, Manager of Coal Mines, in a paper recently presented to a meeting of the officials of the J and L Steel Corporation. A part of his paper is quoted below:

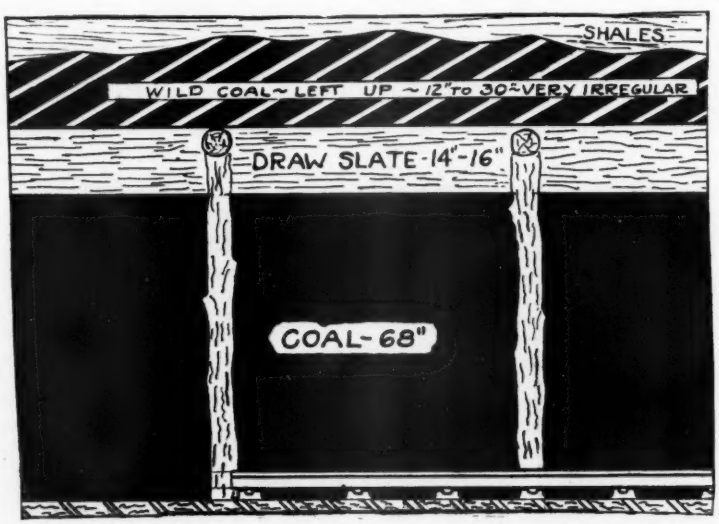
"A typical section of the Pittsburgh seam as found in our Vesta Mines, starts at the bottom with a firm fireclay floor; an average thickness of useable coal, 68 in.; overlaid by a band of drawslate from 14 in. to 16 in. and immediately over the drawslate is the so-called 'wild' coal, which varies greatly in thickness—in rare instances as thin as 8 in. and sometimes up to 3 or 4 ft. Above this, the roof strata is principally shales and, being soft, is difficult to hold, even with timber, once the 'wild' coal is removed, but when this coal is left intact, it forms a comparatively good roof under which to work, if well timbered.

Fire protection is a major safety feature

"The drawslate will vary in hardness from that which must be drilled and shot down, to soft slate which will come with the coal no matter how carefully worked. This is especially true when working pillar sections, where roof weight is on the coal and drawslate before the cuts are made. With our present, or 'selective,' mining system, we attempt to remove the coal first while holding the drawslate, then drop the drawslate down and load it separately. This results in our loading approximately one ton of slate for every two tons of coal mined.

"There are numerous disadvantages to this method when loading mechanically. The work cannot be kept on a proper cycle, since many operations cannot be completed at one time but men must be called back to finish the operations.

"For instance, the shot-firer first shoots down the coal and then must double back to shoot down the slate, and, of course, some time must elapse while waiting for the smoke to clear before entering the place again for the next operation. Timbering cannot be started until the drawslate is down, even if the coal is cleaned up. The loading machine, after loading the coal, must either be pulled out and wait for the shotfirer, or go on to the next place and double back to load the slate after it is shot. The motor crews serving the loading machines



Typical section of Pittsburgh seam at vesta properties

have to build up trips of slate and coal, which must be sent out separately and in different directions.

"As soon as our proposed consolidated preparation plant can be installed and made ready for operation, it is planned to begin 'full seam mining.' With this plan, the entire seam from the floor to the bottom of the wild coal is taken in one mining operation; this means the coal and drawslate will be drilled, shot and loaded out together, and the separation made at the surface preparation plant, where refuse disposal will be provided. This plan will eliminate the operating delays as above outlined and allow the regular work cycles to be set up which will be seldom varied. This will result in cleaner, safer mines, with considerably more production per machine."

Supplementing Mr. Cooper's statement, the Pittsburgh drawslate has always constituted one of the major problems of mining in this field and with mechanical loading, this problem has become greater. As has been learned by experience, the cost of delays increases proportionately as the productive capacity of the loading unit increases and what was not a serious delay in the days when a hand miner produced 10 tons per shift, has become progressively more serious as the performance of the loading operation has been raised. In a modern mechanical mine, a few minutes' time loss—whether caused by roof trouble, power failure, inadequate haulage or poor coordination—can result in an appreciable tonnage loss to a high capacity unit and this fact is recognized as basic in the Vesta planning.

Mining System

Mining is by the block system which, modified in one form or another, is almost universally used in this field. The entries are driven 12 ft. wide; at present these are turned at 90 degrees on 100 ft. centers, but this is to be changed to 80 ft. centers with all places angled at 60 degrees. With track mounted equipment, a 60-degree angle greatly facilitates turning off new places. The blocks in the panel are mined by open-end cuts and a high pillar recovery is made.

All equipment is track mounted and an operating unit consists of one mechanical loader, one combination cutting and shearing machine and one mounted drill—the loaders and the cutters are furnished both by the Jeffrey Manufacturing Company and the Goodman Manufacturing Company, and the mounted drills are by Jeffrey. One 8-ton trolley reel gathering locomotive serves each loader, delivering cars to a switch near the working faces; an intermediate locomotive hauls between this switch and the main line. The cars at present are about 3½-ton capacity but these are to be replaced by cars of 9-ton capacity of solid steel construction for rotary dumping with automatic couplers and spring bumpers. Shooting is with permissible explosive.

The organization of the crews and the mining practices used in the working sections follow the more or less conventional procedure for track-mounted mechanical loading, with all face operations on a continuous cycle following each other in sequence, from the cutting to the track laying and timbering. As previously described, the mining at present is by the "selective" method but in the near future will be changed to a "full seam" operation.

Haulage

Transportation will be the key to the new Vesta operation and the truth of this statement will be realized by examining the regional map which shows that there will be a main line distance of 10 miles from the back of the property to the slope bottom at No. 4. At present the main haulage of No. 5 is seven miles long. A mine haulage system that will transport 27,000 tons of material per day, over such distances, must be built to railroad specifications; this is, of course, recognized and the installation is being made accordingly.

Of first importance comes the matter of roof support and, already, hundreds of steel and wood sets have been put in place as permanent timbering for the main and face entries. Also, hundreds of cars of slate have been hauled to the outside, loaded from clean-ups along the entries, from bad top taken down and from top or bottom brushing to bring the track to as nearly a uniform grade as possible.

The main haulage units will be two 20-ton locomotives in tandem and the completed main line will be double-tracked, partly in one entry and partly in two parallel entries as conditions determine. The present rail is 90 lb. with welded joints laid on wood ties which either will be treated or will be of locust to give the long life desired. The trolley, feeders and bonds will be of sufficient size to furnish adequate power for all operations and all panels will be sectionalized. The mine haulage will end at the slope bottom, where the cars will dump into a bin from which a belt conveyor will take the coal up to the outside cleaning plant.

All coal from No. 4 and No. 5 mines will come to the slope and the map shows where the new main line haulage will leave the No. 4 main headings and cut through to No. 5, intercepting the No. 5 mains about one mile inside the portal. As each main line is to be double-tracked, the haulage from this junction outbye to the slope bottom, will have four tracks, each pair serving its own mine and having its own rotary dump. These dumps will be placed side by side and will discharge into the same bin but there will be interchange switches between the four tracks so that either mine may use either dump as conditions indicate. The main lines will not have automatic block signals, but there will be three dispatchers so that the trips from each mine will be under control at all times and handled without interference or delays.

The grades on the main line are against the loads but are not excessively steep—usually averaging 1 per cent to 2 per cent except for some

All operations underground are mechanized

rock rolls which are graded out. A point of considerable importance in the transportation system is that the new No. 4 main line, cutting through to No. 5 as described in the preceding paragraph, eliminates a present lift of 54 ft. against the loads and reduces the length of the No. 4 haul by almost three miles. The saving in the power cost resulting from these two factors is a very appreciable item.

Portals for Men and Supplies

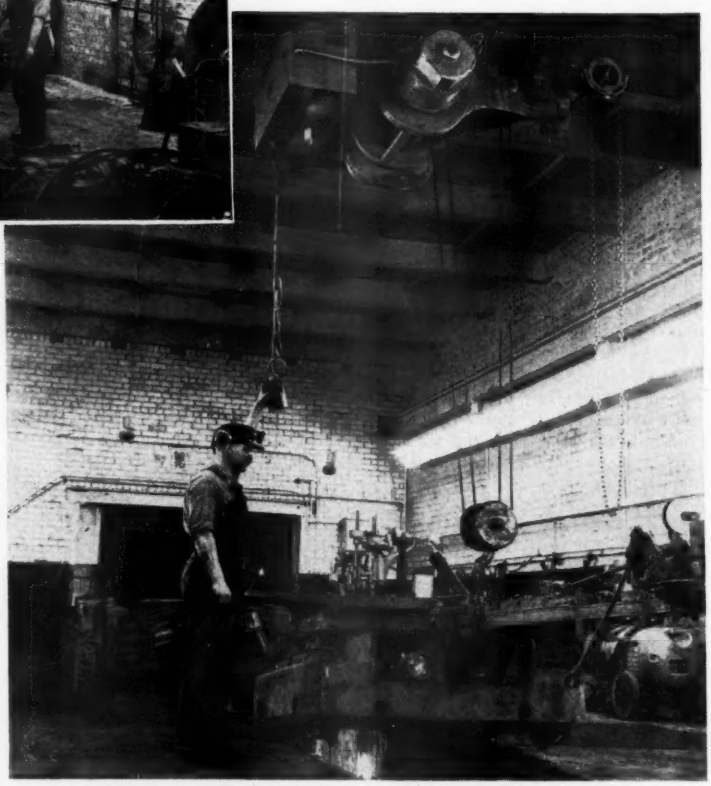
There must be a number of ways of ingress and egress to a property of this size and this feature has been well taken care of. In addition to the several portals for haulage, man-trips and mine fans at the drift mouths of both mines, there are also six shafts as shown on the map. The Nickeson shaft has a slate hoist, the Richey shaft is used as a portal for men and supplies, while the Clover Hill, Hastings and Thompson shafts are for air. The Kefover shaft to No. 5 has just been completed and is to be a portal for this section of the property for men and supplies. The Greenlee shaft which is not yet completed will be a portal and near the extreme western boundary of the property a future shaft is projected. The interval between these various openings averages about two miles.

A ski tow applied to coal mining at No. 5 Portal

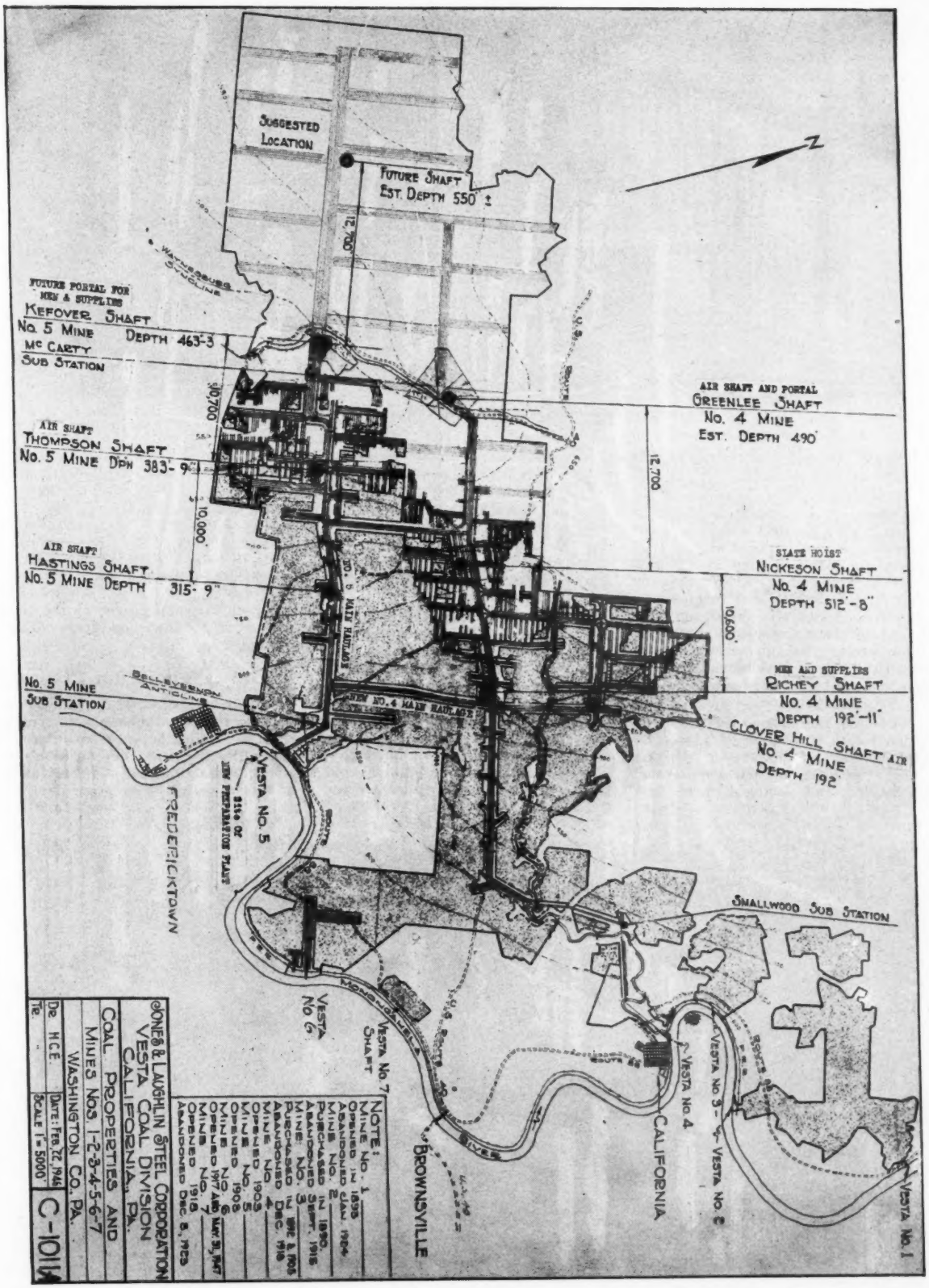
Major as well as minor repairs are made underground

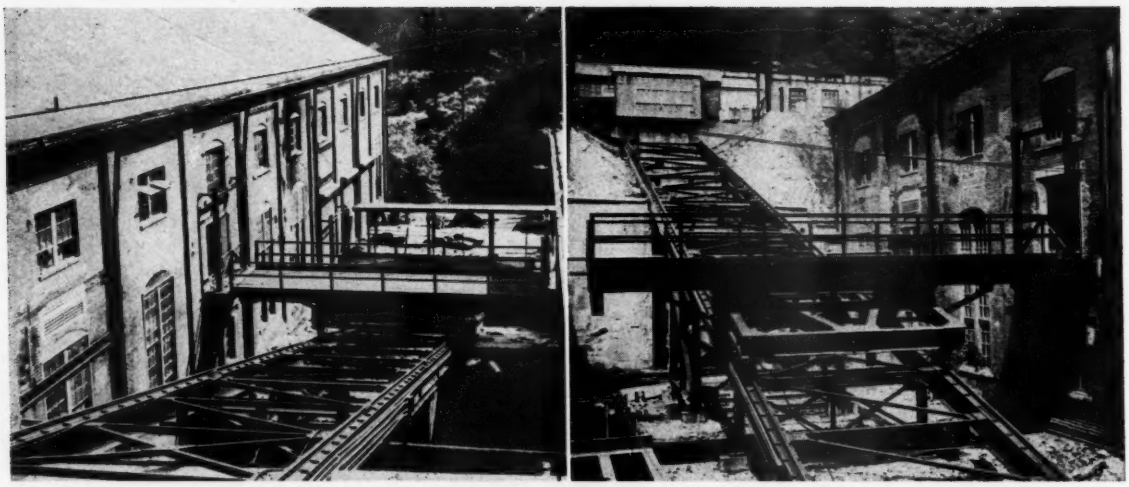
Machine Maintenance

One of the interesting phases of the reconstruction is the provision being made for machine and equipment maintenance. The total number of pieces of the major equipment—loading machines, cutting machines, locomotives and drills—needed to produce the proposed tonnage, combined with the numerous small parts, tools and accessories, is so great that its maintenance and repair constitute a young industry in itself. This has been well planned and organized. There are, first, the traveling inspection and maintenance men in the working panels. Next are the underground shops where replacements and minor overhauling is done. These underground shops are well equipped with pits, overhead cranes and the other tools and facilities needed and in addition, keep a certain amount of supplies



Underground shops are fully equipped to handle heavy machines


SUGGESTED LOCATION
FUTURE SHAFT
EST. DEPTH 550' ±
12,700'
WAYNESBURG SYNCLINE
FUTURE PORTAL FOR MEN & SUPPLIES
KEFOVER SHAFT
No. 5 MINE DEPTH 463'-3"
Mc CARTY SUB STATION
10,700'
AIR SHAFT
THOMPSON SHAFT
No. 5 MINE DPH 383'-9"
10,000'
AIR SHAFT
HASTINGS SHAFT
No. 5 MINE DEPTH 315'-9"
No. 5 MINE SUB STATION
BELLEVERNON ANTICLINE
AIR SHAFT AND PORTAL
GREENLEE SHAFT
No. 4 MINE
EST. DEPTH 490'
12,700
STATE HOIST
NICKESON SHAFT
No. 4 MINE
DEPTH 512'-8"
10,600'
MEN AND SUPPLIES
RICHEY SHAFT
No. 4 MINE
DEPTH 192'-11"
CLOVER HILL SHAFT AIR
No. 4 MINE
DEPTH 192'
FREDERICKTOWN
VESTA No. 5
SITE OF NEW PREPARATION PLANT
SMALLWOOD SUB STATION
VESTA No 6
VESTA No. 7 SHAFT
MONONGAHELA RIVER
BROWNSVILLE
CALIFORNIA
VESTA No. 4
VESTA No. 3
VESTA No. 2
VESTA No. 1
NOTE:
MINE No. 1 OPENED IN 1893 ABANDONED JAN. 1924
MINE No. 2 PURCHASED IN 1890 ABANDONED SEPT. 1915
MINE No. 3 PURCHASED SEPT. 1915 ABANDONED DEC. 1918
MINE No. 4 OPENED 1903
MINE No. 5 OPENED 1908
MINE No. 6 OPENED 1917 ABD MAY 31, 1947
MINE No. 7 OPENED 1918 ABANDONED DEC. 8, 1923
JONES & LAUGHLIN STEEL CORPORATION
VESTA COAL DIVISION
CALIFORNIA, PA.
COAL PROPERTIES AND MINES Nos. 1-2-3-4-5-6-7
WASHINGTON CO., PA.
Dr. H.C.E.
Date: FEB. 22, 1944
Scale 1" = 5000'
Tie
C-1011



An incline handles heavy equipment from the mine tracks to the main shop

both for the shop and for the repairs at the working sections.

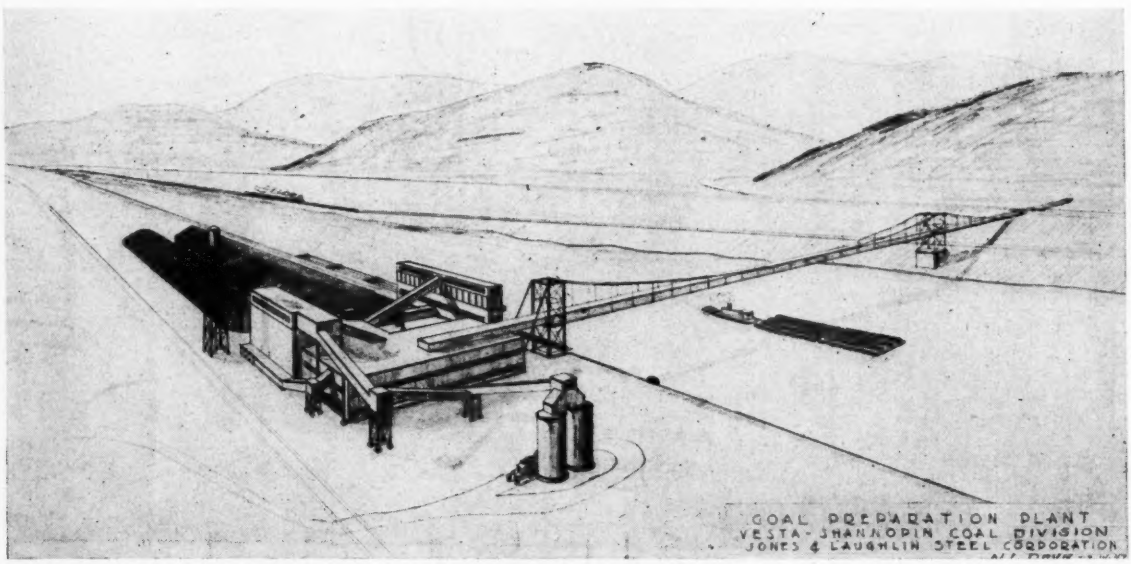
The main feature, however, of the maintenance department, is the large central shop located within a short distance of No. 5 tipple at the drift portal for men and supplies. This is in a brick building, 84 ft. wide by 200 ft. long, which was originally a power house but was abandoned some years ago when power was purchased. Now reconverted, it serves several functions; a machine shop, a supply house, a wash house, a lamp room and an office for the mine foremen.

The machine shop occupies the ground floor, in a space 84 ft. wide by 140 ft. long and has every machine needed for light and heavy repairs of mechanical and electrical parts. All are driven with individual motors. Above the shop floor there is what might be termed the mezzanine—a floor 20 ft. wide extending around on four sides of the building. Here are kept the supplies and repair parts for the entire operation with daily and periodic distribution to the underground centers.

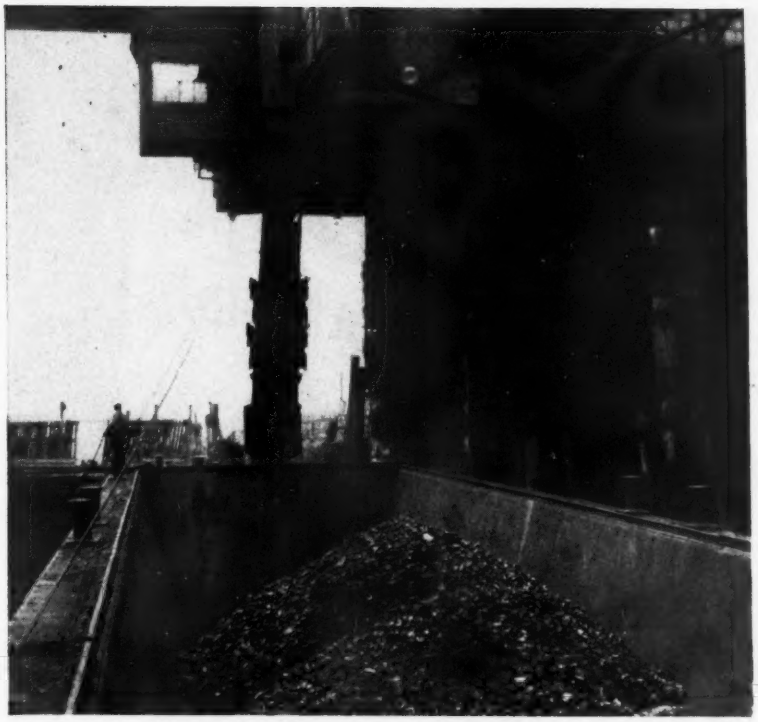
The building is against a hillside and behind it is the portal into the mine about 50 ft. in elevation above the ground floor level of the shop. A very interesting and unique feature here is a means for handling machines and supplies between the mine and the shop. This consists of an incline track built on a slope of 30 degrees along one side of the building, extending from the mine track down to the shop floor level, equipped with a movable platform that is raised and lowered by a rope hoist. The platform is about 30 ft. long and 10 ft. wide and will accommodate the largest piece of underground equipment. In its upper position, on level with the mine tracks, a machine or a supply car is run onto the platform which is then lowered either to the supply room on the mezzanine or to the shop floor on the ground level.

New Preparation Plant

All the underground operations, as well as the maintenance for keeping them in running order, are pointed toward the final act of preparing a metallurgical fuel for the steel mills of the company. The production, as



A preview of the new preparation plant



River barge loading at No. 4 Dock

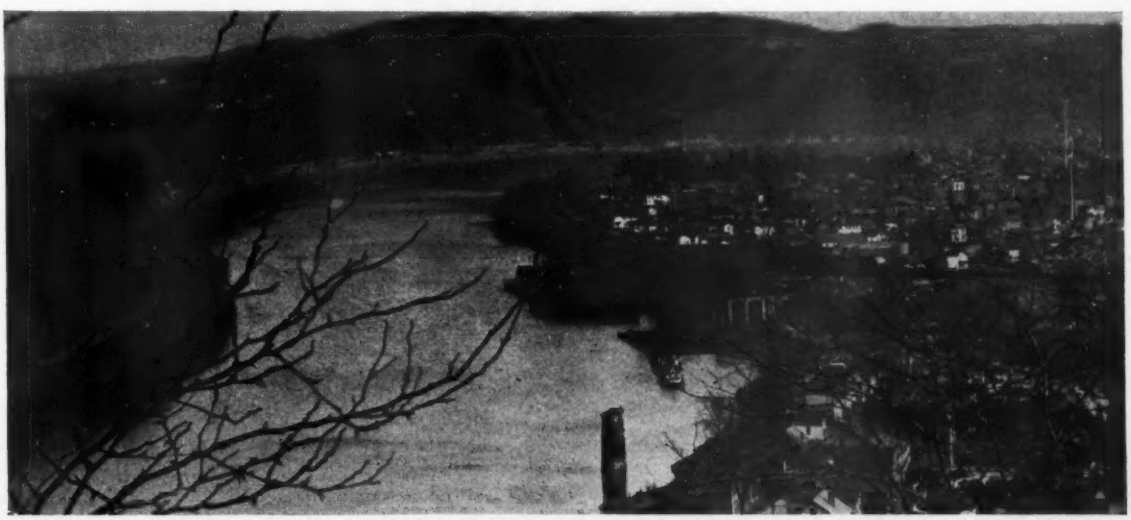
already given in this article, is to be 18,000 tons of cleaned coal per day, which, with from 8,000 to 9,000 tons of reject, means that the preparation plant must have a capacity of 2,000 tons per hour. A plant of this size and a refuse dump for the rejects need plenty of ground room and the site selected is directly across the river from the present No. 5 tipple where there are 700 acres available. This location is indicated on the regional map and construction there is to be started immediately, which will be according to the general plan shown on the preliminary drawing on the opposite page. The contract for the plant has been awarded to F. H. McGraw & Co.; F. J. Titus, vice president, will head the engineering and designing and Nelson L. Davis, formerly of the Link-Belt Company, will be in charge of the process design.

The mine cars will dump underground into a bin at the bottom of a slope whose portal will be near the bank of the river across from the preparation plant site. As the cover here is comparatively light, the slope sinking presents no unusual difficulties. However, the Monongahela River must be crossed and this will require a rather elaborate steel bridge. A 60-in. belt conveyor will take the coal from the mine car dump up the slope and across this bridge to the cleaning plant.

All the details of the coal preparation process are not yet completed but as now planned, the 5-in. x ¼-in. sizes will be cleaned by a heavy media float and sink process with the ¼ in. x 0 product treated in free discharge launders and concentrating tables. As has been previously stated, facilities will be provided for loading clean coal both to river barges and railroad cars. This cleaning plant is probably the first that has been originally designed to handle the product of full seam mining and an overall preview of the installation shows that both as to the size of the structure and the quantity of the material to be handled, it will rank among the foremost in the country.

Acknowledgment

In an undertaking of this magnitude, it is impossible to give due credit to everyone who has had a part as so many have contributed ideas and suggestions that have been incorporated in the plans. Needless to say, it is an outstanding job and special acknowledgment is due to the two men of the J and L organization who have had direct charge of the work that has been done so far—E. R. Cooper, Manager of Coal Mines, and W. E. Hess, general superintendent of the Vesta-Shannopin Coal Division.



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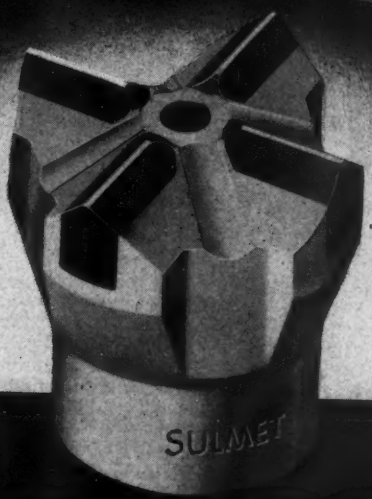

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The Coeur d'Alene One-Man Jumbo

★

By JULIAN W. FEISS
Mining Congress Journal

★

This Interesting New Drill Carriage Has Recently Been Tested Under Actual Mining Conditions. Ease of Operation Coupled with Simplicity in Construction May Result in Its Wide Use in the Metal Mining Industry.

MINE operators for a number of years have been striving to increase the mobility of rock drill assemblies. Time consumed in transporting drill equipment to and from the face is unproductive and if this interval can be lessened, a material saving in cost can be effected. Furthermore, if time can be saved at the face in setting up for drilling, the nonproductive interval can be further reduced.

Prior to the application of the pneumatic column to drilling, more than half the driller's time was spent in setting up and tearing down. Either a horizontal or a vertical set-up was a tedious performance, especially if the drift exceeded 5 x 7 ft. dimensions. Usually two men were required, the bar for the drill had to be jacked into place, wooden blocks installed at the extremities and wedges driven to take up the play. Once the bar was in position the set-up had to be made firm by jacking, and if a heavy rock drill was being used, two men were required to operate the screw. A driller who did not test his bar periodically throughout the drilling period was likely to be caught by the collapse of the assembly, and aside from time lost in the drilling cycle in restoring the set-up, the safety hazards could be very real. Furthermore, the lifting of a heavy machine on and off the bar frequently resulted in injury to the miner; altogether, the task of putting in a round underground was both tedious and in years past, at times by no means safe.

Jumbos Are Here to Stay

Today all of this is changing. The use of the pneumatic column jumbo has become routine in many of our metal mining operations and, where it is economical, the drill carriage is supplanting other methods of setting-up when driving headings.

Drill carriages or jumbos are by no means a new development although their application to metal mine operation is fairly recent. More than a generation ago a type of jumbo was in use for driving tunnels through the Swiss Alps and they have been used for years in driving subways and water aqueducts in and around New York City. However, it has been difficult to apply jumbos to metal mining. Where frequent turn-outs are required and where drifting may take an erratic course in following a vein, the application of tunnel jumbo practice is fraught with difficulty. Tunneling and mining are quite different operations despite superficial similarities. Furthermore, due to the irregularity in shape of orebodies, jumbos have not been practical for stoping operations.

During the summer of 1946, Ralph Neyman, general superintendent of the Hecla Mining Co. at Burke, Idaho, began experimenting with a one-man jumbo designed to facilitate the setting up and removal operations of rock drills at the face. Essentially designed to be used in cut and fill stopes, this jumbo can also be used in driving small headings. The success of Mr. Neyman's experiment can be judged by an order for 40 of these jumbos placed by the Star Mine of the Sullivan Mining Co., at Burke, Idaho. These jumbos will mount the latest type of automatic feed drifters equipped with steel centralizers and New York backheads.*

A One-Man Proposition

The new drill jumbo permits the handling and transportation by one man of a complete single drilling assembly, including the column, rock drill and hose; thus eliminating loss of time in transporting and setting up the drill at the face and removing it after the rounds are completed. The conventional type of air column jumbo, now in use in many of our metal mining districts, consumes considerable time and labor in moving the column and drill arm to the face, in setting it up rigidly in position, in connecting the air hose between the air supply line and drill, and in carrying it to the face and mounting it on the drill arm. This invention of Neyman's is designed to eliminate much of this labor.

Fig. 1. The assembly can be wheeled from place to place by one man

The assembly is constructed so that it may be partially collapsed for transportation or may be completely collapsed for passage through openings or raises where clearance is small. The four advantages of this new jumbo can be stated as follows:

1. The complete drill column and assembly is easily transported by one man. Fig. 1.

* The New York drill backhead automatically turns on the water when the air valve is opened.

Fig. 2. For transportation in cages or up raises, the carriage is completely collapsed

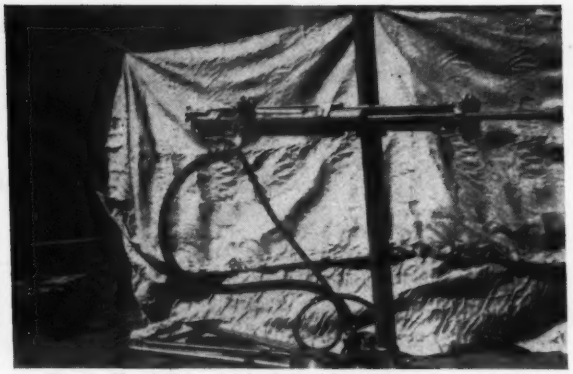


Fig. 3. The drill is attached directly to the column. In the drilling position the carriage frame is out of the way

2. The assembly can be readily collapsed for transportation in cages, through small tunnels and up raises. Fig. 2.
3. The assembly can be erected at the face and torn down by one man in a short period of time.
4. The mobility of the assembly eliminates the necessity for a drill arm upon the column—the drill is mounted directly on the column itself by a standard or quick-change clamp. Fig. 3.
5. The one-man jumbo allows the operator to stand back under the timber while he is drilling his round, an important safety advantage as he is free from possible rock falls. With the reverse feed drill it is necessary for him to pull steel from the hole at the face as the stoper does not use collared steel.

Mobility is accomplished through the use of wheels which can either be rubber tired for use in stopes, Fig. 4, or steel-flanged for use on track at a heading, Fig. 1. The trackless assembly has 10-in. wheels with zero pressure tires on an anti-friction bearing axle of 1¼-in. diameter. The entire carriage is wheeled from place to place in a manner similar to the handling of a baggage truck.

As shown in the illustrations, the assembly consists of the wheeled carriage, an Ingersoll-Rand DA30, 3-in. machiner, a 7-ft. column or "stinger," the machine hoses, and a base to the air column containing the manifolds and valves for air and water attachment. At the Star Mine a 30-in. change of 1-in. hexagon steel is used with A-O Jackbits of 1⅞-in. gauge.

In the drilling position the air column is free from the carriage which is lowered out of the way and rests on the sill of the drift. Fig. 3. As the base housing which contains the valves and manifolds is designed to elevate the wheels from the sill in the drilling position (see drawing) the assembly is clamped rigidly in place when the rock drill is being used.

Simplicity of Operation

The use of the jumbo is quite simple. The entire operation can be done by a man of average strength. With the assembly in either the partially or totally collapsed position, the operator rolls it to the spot where drilling is to be done. When semi-collapsed, the column is supported by a steel brace of ¾-in. tube which terminates in a yoke. In the full collapsed position this brace and yoke is folded out of the way. Fig. 2.

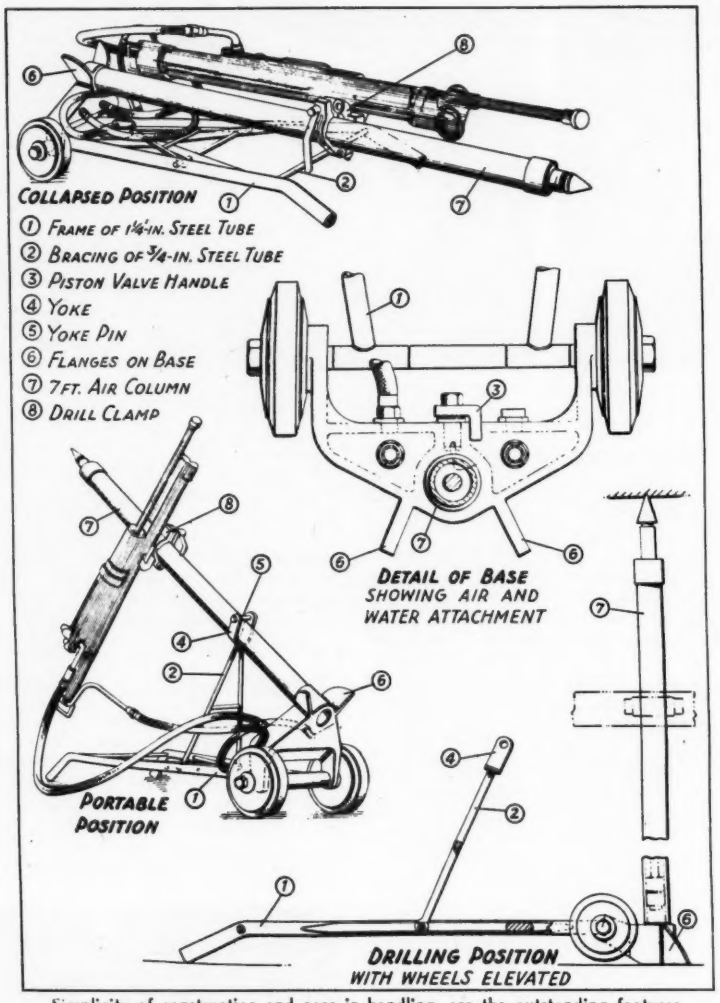
Assuming the machine is in the semi-collapsed position, which would usually be the case underground, the operator removes a pin which holds the yoke to the column and swings the column and base to a vertical position where it rests on the base and on two forward projecting flanges in the housing. The operator then connects his air manifold in the base and rotates the air valve handle in the center at the rear of the base to an angle of 90 degrees. This forces the piston upward and the pointed stinger into the back of the drift or stope. The carriage assembly rests on the sill out of the way. The drill is now swung about its axis on the vertical column, the water line is connected to the base, the steel inserted and work commences. In drilling the face of a drift or crosscut, a set of holes can be put in to the right of the center line and the column lowered and moved on the wheels to the left of the center line for drilling the remainder. In a small drift using a burn cut this would not be necessary but where holes are drilled for a V or diamond cut the two set-ups would be required.

Tearing down operations are simply a reverse of setting up. The valve handle in the base is turned 90 degrees clockwise and the pressure is released in the piston which retracts by its own weight. The frame of the carriage is swung upward until the yoke engages the column, the pin locks it in position, air and water lines are disconnected from the base and the assembly is ready for transportation to a new locality. If it is desired to collapse the entire machine to move it through a raise to a new level, the brace can be unlocked and lowered while the column and drill are lowered above it to rest against the frame and cross brace between the two handlebars of the carriage. In this position the assembly will pass through an opening of 18 x 22 in.

Weight Kept to a Minimum

The frame of the carriage is made of 1¼-in. and the cross brace of ¾-in. steel tube. Without a machine attached the carriage weighs 260 lb. The machine now in use weighs 190 lb. so the entire assembly totals 450 lb. Obviously any type of drill can be used on the column providing it is

Fig. 4. The trackless model uses 10-in. wheels with zero pressure tires



Simplicity of construction and ease in handling, are the outstanding features of the Jumbo

not too cumbersome and a rotary drill could be substituted for the percussion type. The present 7-ft. stinger is suitable for breast stoping at the Star Mine operations but a longer one could be substituted if conditions so warrant. As many vents or outlets may be bored into the base as are desired for either water or air supply.

The clamp for supporting the drill on the column consists of longitudinally adjustable jaws which are clamped by means of a nut about a conical stud on the drill casing. Pivotally hinged jaws engage the drill column and in the present machine assembly are adjusted by means of a screw threaded bolt. Thus the drill can be slid up or down the column or turned in any desired position by loosening the clamp and jaws.

Under certain conditions it might be desirable in heading work to mount the drill upon a short horizontal bar and the attachment of such a bar presents no difficulties, although some of the present advantages in size and mobility of the assembly would be sacrificed. The use of such a bar would enable the driller to place cut holes from a single set-up in the center of the drift by swinging the machine above and below the horizontal bar, as is standard practice. Mr. Neyman has pointed out that in view of the mobility of the assembly, the use of a horizontal bar, even when drilling cut holes, might be of questionable value. The application of a horizontal bar would probably be justified only in cases where unusually hard ground requires the use of several long cut holes or, under mining conditions where overbreak is not a serious factor in driving the heading.

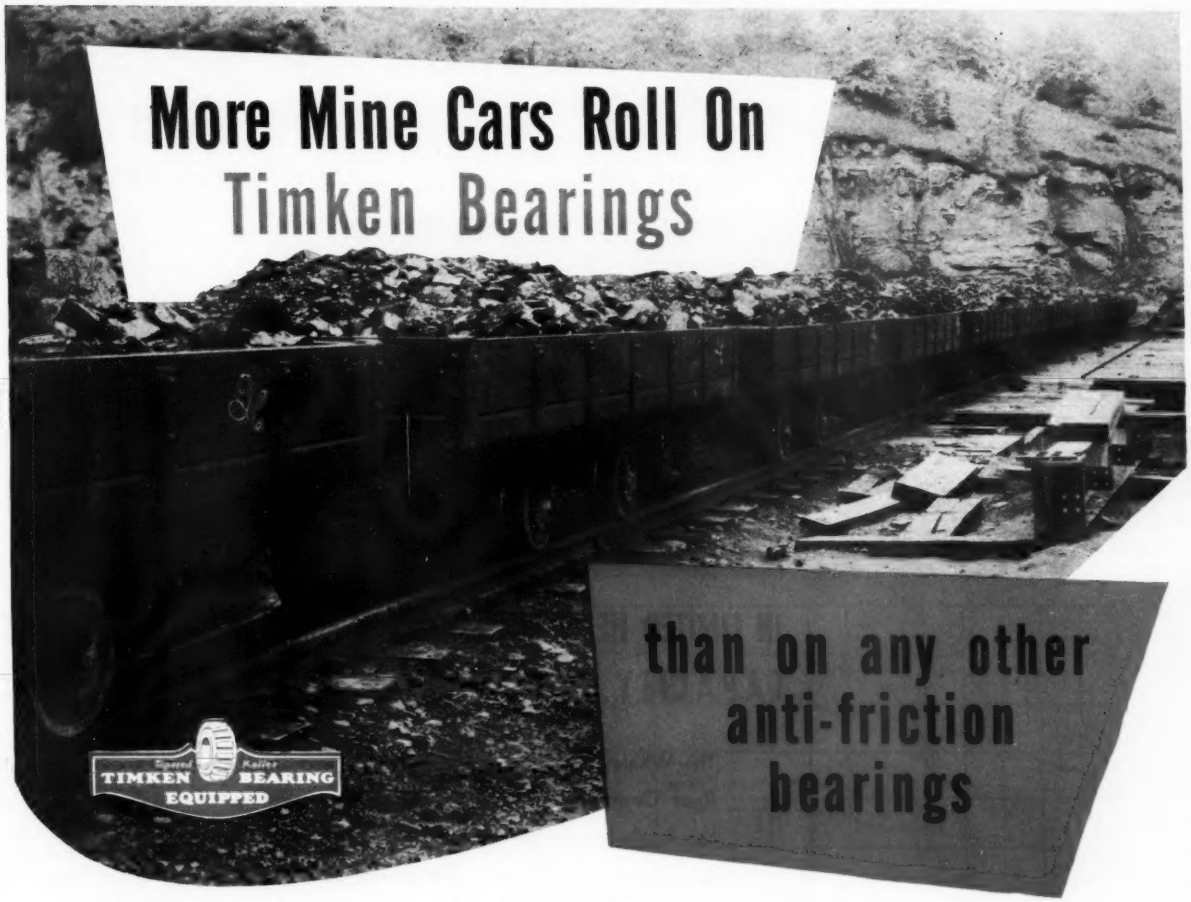
Actual Trials Successful

In actual trials at the same face, using this assembly equipped with a 3-in. automatic percussion drill of standard type, twice as many holes were drilled per shift as with a 3-in. reverse feed drill of the latest design mounted on the conventional column.

Although the Coeur d'Alene one-man jumbo may not by any means be applicable to all types of mining and heading work, it is obviously a device worthy of consideration when planning development of breast stopes and small headings. The present assembly is primarily designed for use in stopes on floors but it can be used to advantage in tunnels which are being advanced by double drum slusher methods wherein the muck is dragged back to the cars by a scraper and no track is installed within close proximity of the face.

Patents have been granted to Ralph Neyman on this new jumbo and its increased application is anticipated throughout the Coeur d'Alene region where mining methods are particularly suited to its use. The author is indebted to the officials of the Hecla Mining Co., and especially to Mr. Neyman, for permission to publish this material.

Fig. 5. The air valve handle for the column is at the rear of the base



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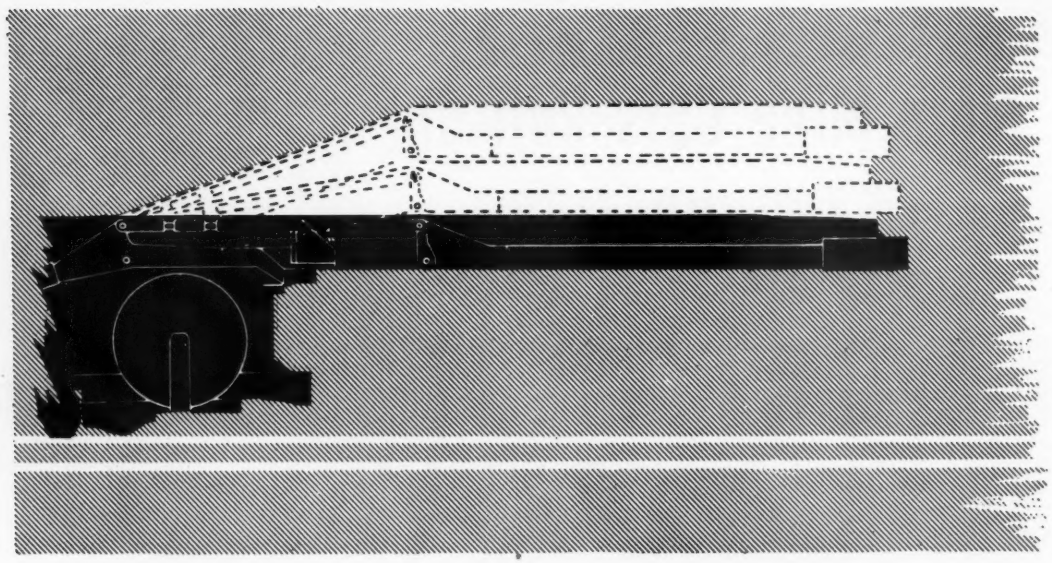

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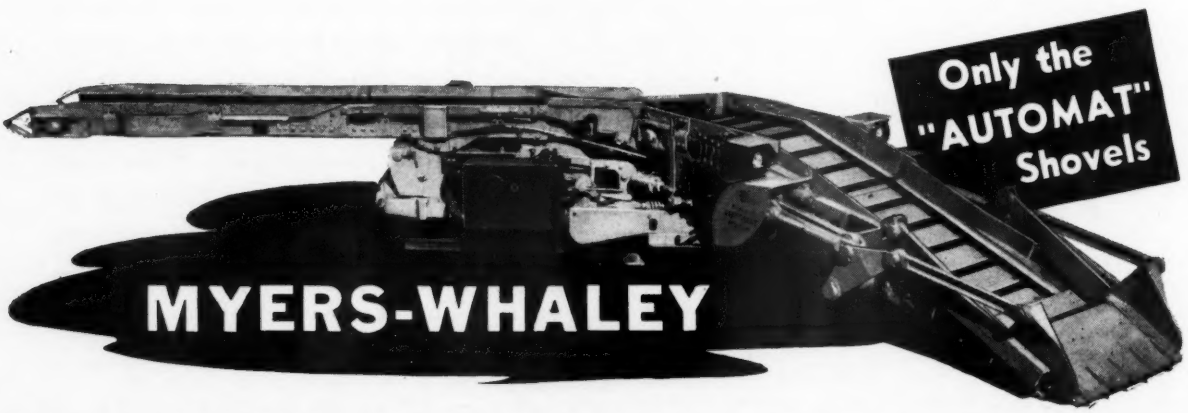

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Coal Mine Haulage Accidents

The Safety Committee is Making a Study to Determine How Haulage Accidents Occur and to Recommend Methods for Their Reduction

By A. J. BARTLETT
Chairman
Subcommittee on Haulage

WHEN the "Safety First" movement was started in coal mining there was a great deal of inertia to overcome to get the idea accepted that mine accidents could be prevented. The average coal miner was inclined to be rather fatalistic and could not see why he should take trouble to try and prevent a possible accident which, in his mind, would or would not occur regardless of an act of his. Furthermore, because men underground were continually subject to danger, they had the attitude that safety measures indicated unmanly fear. Much had to be done along educational lines by many individuals, companies and agencies to "sell" the idea of safe working, and to interest the miner in protecting his own life, but after a number of years of intensive work these efforts began to bear fruit and recent years have seen a great reduction in accidents and fatalities underground.

There is, of course, still much room for improvement, but mine accidents have now been reduced to the point where refinements in our safety work are called for. In other words, in addition to dealing with accident prevention as a broad general subject, we should examine each operation and occupation with a view toward determining the hazards for men performing that particular job. In such an examination, we must depend to a large degree upon statistical analyses to show what condition exists; then with this knowledge we can intelligently plan corrective measures.

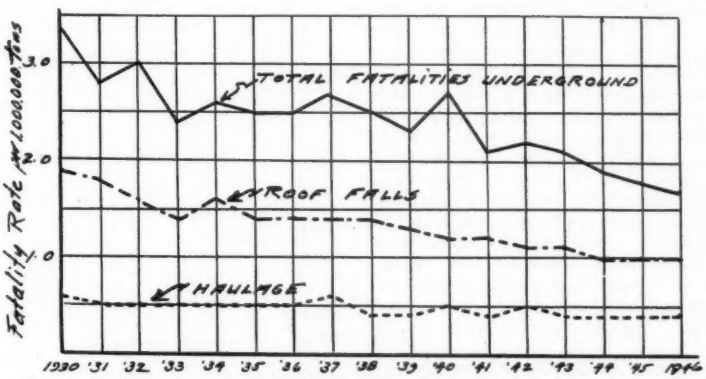

Fig. 1. Fatality rates per 1,000,000 tons of coal mined underground for U. S. Bituminous production (compiled from table 1)

TABLE 1.—FATALITIES IN U. S. BITUMINOUS PRODUCTION

Showing Number of Fatal Accidents Underground for Each 1,000,000 Tons of Coal Mined

(Compiled from U. S. Bureau of Mines Reports)

Year	*Total Underground Fatalities*	*Fatalities From Roof Falls*	*Fatalities From Haulage*	*Fatalities From Other Causes*
1930	3.4	1.9	0.6	0.9
1931	2.8	1.8	0.5	0.5
1932	3.0	1.6	0.5	0.9
1933	2.4	1.4	0.5	0.5
1934	2.6	1.6	0.5	0.5
1935	2.5	1.5	0.5	0.5
1936	2.5	1.5	0.5	0.5
1937	2.7	1.5	0.6	0.6
1938	2.5	1.5	0.4	0.6
1939	2.3	1.4	0.4	0.5
1940	2.7	1.2	0.5	1.0
1941	2.1	1.2	0.4	0.5
1942	2.2	1.1	0.5	0.6
1943	2.1	1.1	0.4	0.6
1944	1.9	1.0	0.4	0.5
1945	1.8	1.0	0.4	0.4
1946	1.7	1.0	0.4	0.3

State and U.S. Reports Studied

With the foregoing in mind, the Safety Committee is making a special study on underground haulage. A first step in this study is to see whether or not haulage is a greater hazard than mine roof—that is, whether the frequency rate of haulage accidents is higher than the frequency rate of roof-fall accidents, when taking into consideration that fewer men are employed in haulage as compared to the number who are exposed to roof falls. The committee decided to base this study on the accident statistics from the major coal states and to date, figures from West Virginia and Illinois have been analyzed, together with a brief statement covering Pennsylvania. These figures and certain conclusions drawn from the records are presented herewith.

Before discussing the state reports, it might be well to get an over-all picture of what has taken place in all of the coal mines in the country. This is the purpose of Table 1 (compiled from U. S. Bureau of Mines reports), which covers all bituminous deep mines during the years since 1930, showing the number of fatalities that have occurred for each million tons of coal produced underground. The figures eliminate surface employes of deep mines, as well as all open pit operations. Keeping in mind that the committee is making a special study on haulage, Table 1 compares the fatal accidents from roof falls and haulage, which two sources now account for about 80% of all underground injuries. The "other causes" include electricity, machinery, explosions, explosives and handling materials, but these accidents are not covered in this report.

It will be noted in this table that there has been a marked improvement in coal mine safety since 1930 as shown by the steadily decreasing number of fatalities underground. The over-all record is paralleled by a corresponding reduction in accidents from roof falls, but the haulage accident rate fell somewhat behind the general rate of improvement made in all operations. From 1930 to 1940, all fatalities, as well as roof falls, were reduced 50 per cent while haulage accidents were reduced only 33 per cent. (See Table 1.) This is illustrated more graphically in Fig. 1, where the haulage curve appears to have reached a level for the past ten years.

West Virginia Records

A study of the accident records contained in the annual reports of the Department of Mines of the State of West Virginia, covering fatal and non-fatal accidents from 1940 to 1944, inclusive, brought out the following facts for the five-year period:

There were 384 men killed in haulage accidents with a frequency rate of 3.24 for fatal accidents in haulage operations, or for every 1,000,000 man-hour exposure on haulage 3.24 men were killed.

Fatal accidents from roof falls amounted to 815, with a frequency rate of 0.93 for fatal accidents from roof falls as compared with the 3.24 frequency rate for fatals in haulage operations.

There were 17,205 non-fatal haulage accidents with a frequency rate of 144.99 for non-fatal accidents in haulage operations, or for every 1,000,000 man-hour exposure 144.99 non-fatal accidents occurred.

Non-fatal accidents from roof falls during this same period were 12,109, with a frequency rate of 13.85 as compared with the 144.99 frequency rate for non-fatal accidents in haulage operations.

It is true, a greater number of men are killed from roof falls, but the figures in this study reveal that on a man-hour exposure basis fatalities on haulage are three times greater and non-fatal accidents ten and one-half times greater than accidents from roof falls.

A further breakdown in the study of fatal accidents on haulage during this period reveals some facts which may be of interest. Of the 384 men killed, 48 were killed in derailments, 15 while coupling, and 321 from other causes. An analysis of these 321 other causes show the following:

Insufficient clearance
Collisions
Trips breaking loose on grades
Runaways from improper scotching and blocking
Caught between the car and face or rib
Caught under low top
Dragged out of motor deck by cable
Caught in track while handling switches without throws
Losing balance and falling out of motor
Getting off in front of moving trip to throw switches and open doors
Attempting to escape from electric arc and fell or jumped out of motor
Caught by loose clothing and dragged into close clearance
Excessive speed
Backing up trips without signal from brakeman
Starting or running trips without orders or signals

TABLE 2.—FATALITY RATE FOR ILLINOIS—1930-1944

Showing Number of Fatal Accidents Underground for Each 1,000,000 Tons of Coal Mined

(Compiled from Illinois Department of Mines Reports)

Year	*Total Underground Fatalities*	*Fatalities From Roof Falls*	*Fatalities From Haulage*	*Fatalities From Other Causes*
1930	2.3	1.5	0.5	0.3
1931	2.3	1.5	0.4	0.4
1932	4.2	1.3	0.4	2.5
1933	2.3	1.5	0.4	0.4
1934	2.4	1.4	0.6	0.4
1935	2.1	1.0	0.5	0.6
1936	2.2	1.4	0.3	0.5
1937	2.1	1.2	0.5	0.4
1938	2.6	1.4	0.6	0.6
1939	2.4	1.5	0.6	0.3
1940	2.2	1.3	0.6	0.3
1941	2.4	1.2	0.4	0.8
1942	1.8	1.1	0.4	0.3
1943	1.7	0.9	0.5	0.3
1944	1.5	1.0	0.3	0.2

TABLE 3.—HAULAGE FATALITIES UNDERGROUND IN ILLINOIS—1940-1944

Showing Occupations and Number of Men Killed

(Compiled from Illinois Department of Mines Reports)

Occupation	*1940*	*1941*	*1942*	*1943*	*1944*	*Total*
Haulage Employes:						
Motorman	2	4	2	4	2	14
Trip rider	3	3	5	7	6	24
Driver	5	2	2	3	3	15
Total Haulage						53
Other Employes:						
Cager	..	..	3	1	1	5
Track-timber	..	1	..	1	2	4
Dispatcher	..	..	..	..	1	1
Machine runner	1	..	..	2	2	5
Shuttle operator	..	..	1	1	..	2
Driller	3	..	1	1	..	5
Miner	1	2	1	2	..	6
Repairman	1	1	..	..	..	2
Shiftman	1	..	1	..	1	3
Foreman	1	..	3	4	1	9
Total others						42
Grand total	18	13	19	26	19	95

Disregard of instructions from dispatcher
Standing up in deck nipping and fell out and run over
Riding in trip and raised up and struck roof or header
Jumping from motor of runaway trips
Thrown out of car by sudden stop or jerk
Crossing track in front of oncoming trip
Jumping on front bumper of moving cars and motors
Riding front bumper of trips being pushed
Failure to properly align switches
Defective track and switches without throws
Riding between cars

In the age grouping of haulage fatals, it was found that 50 per cent of all the fatalities occurred to men between the age of 25-40, with the age group 30-35 being the highest with 20.7 per cent, and it is interesting to note that 90 per cent of all the men killed in haulage accidents during this period had more than five years mining experience. In the occupational grouping, it was found that of the 384 fatalities, 115 were motormen, 150 were brakemen, and 119 in other occupations. Of the 119 other occupations, fatalities occurred in 29 different labor classifications from the mine foreman on down.

Illinois Records

A study was made of the accident records contained in the coal reports of the Illinois Department of Mines. A compilation of the fatality rates per 1,000,000 tons mined is given in Table 2; this is similar in form to Table 1 and it will be seen that the Illinois record closely parallels the records for the total United States.

An occupational breakdown is made in Table 3, also taken from the Illinois Coal Reports, showing the total haulage fatalities for the five years of 1940-1944, as occurring to men directly engaged in haulage operations and men employed in other underground work. This shows that of the total 95 men killed during that period, 53 were haulage operators—motormen, tripriders, drivers—while the other 42 were in various other classifications, from foremen on down. The records for non-fatal haulage accidents (not tabulated in this report) shows a total of 2,313 injuries—1,527 to motormen, tripriders, and drivers, and 786 to men in other occupations. A further analysis brings out the following facts:

During this period 53 men were killed in haulage accidents, with a frequency rate of 1.9, or for every 1,000,000 man-hour exposure in haulage operations 1.9 men were killed.

During this same period, 1,527 non-fatal accidents occurred in haulage operations, with a frequency rate of 54, or for every

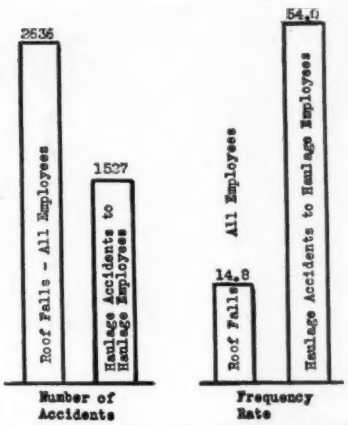

Fig. 2 Non-fatal accidents from roof falls and haulage; 1940-1944, Illinois

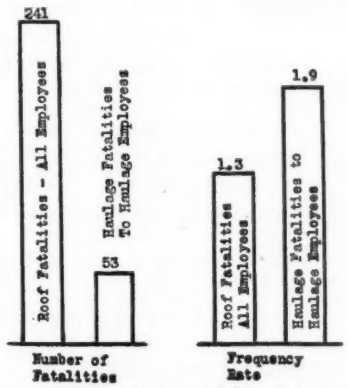

Fig. 3 Fatalities from roof falls and haulage 1940-1944, Illinois

1,000,000 man-hour exposure on haulage, 54 non-fatal accidents occurred.

Roof fall fatal accidents during this same period amounted to 241, with a frequency rate of 1.31, as compared with the 1.9 frequency rate for fatals in haulage operations.

Roof fall non-fatal accidents during this same period were 2,636, with a frequency rate of 14.84, as compared with the frequency rate of 54 for non-fatal accidents in haulage operations.

Here again it is true that more men were killed and injured from roof fall accidents, but when viewed from the fewer number of men employed in haulage operations, and put on a man-hour exposure basis, the figures reveal that fatal accidents on haulage are 50 per cent greater and non-fatal accidents about four times greater than accidents from roof falls. (See Figs. 2 and 3.)

Pennsylvania Records

The Pennsylvania bituminous record over the past three years, as tabulated in Table 4, conforms to the general trend. There has been a steady improvement in the accidents rate for the total men employed but not for the haulage employes alone, and moreover it will be noted that the fatality rate for the haulage men is nearly three times as high as the general average rate for all operations.

Conclusion

In presenting this report the committee has no thought of comparing the records of one state against those of another. In fact, the figures given in the foregoing tables for the different states are each calculated on somewhat different bases and are not, therefore, directly comparable. Furthermore, it can readily be understood that while such records cannot be made with any great degree of mathematical accuracy, they nevertheless do accurately show what conditions exist.

The purpose of this report is to bring to the attention of the industry that the underground haulage is one of the mining operations where further safety efforts are needed. As shown previously, haulage accidents result from many causes, most of which are capable of correction; such hazards as caused by insufficient clearance and lack of switch-throws can be corrected by proper installation, but by far the greater percentage of accidents can only be eliminated by the men themselves. Some discipline, of course, is necessary but a voluntary observance of safety practices through education is the best answer to accident prevention.

TABLE 4.—PENNSYLVANIA BITUMINOUS MINING FATALITY RECORD FOR UNDERGROUND HAULAGE

	1944	1945	1946
Total employes for region	99,942	98,764	103,894
Number of fatal accidents	164	141	128
Total men employed per fatality	609	700	811
Number of haulage employes	8,722	8,429	8,282
Number of fatal haulage accidents	32	38	30
Number of haulage employes per fatality	272	332	276

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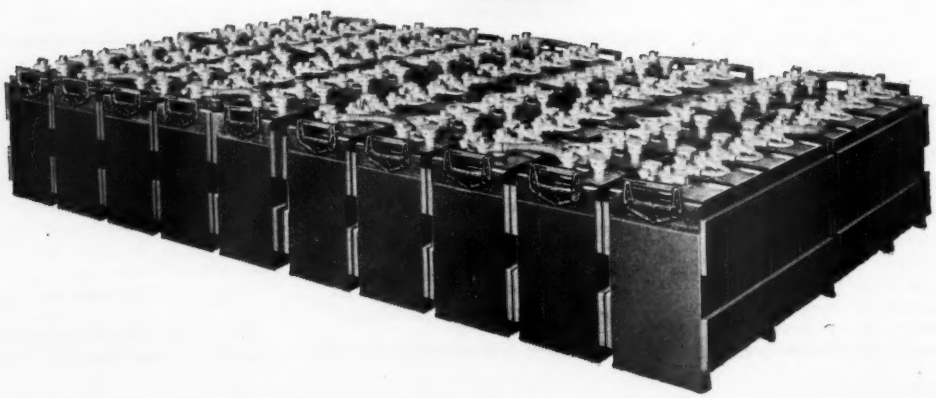


WHEELS OF GOVERNMENT

As Viewed by A. W. DICKINSON of the American Mining Congress

IMMEDIATELY following the President's return cruise on the "Mighty Mo" from his good-will visit to Brazil, the White House was plunged into a series of conferences on domestic and international affairs with heavy stress laid on aid to European nations. The emphasis given to the calling of a special session of Congress for immediate help to Europe resulted in a meeting of leaders of the Senate and House Foreign Relations and Appropriations Committees. The full membership of these committees is scheduled to meet in mid-November but the calling of a special session of Congress was deferred until after the committee deliberations and will probably not come until mid-December, if at all.

Meanwhile the members of these committees and a number of other Congressional groups are touring British and European countries with a view to bringing back first-hand information which will have an important bearing on such action as may be taken in any special session or in the Second Session of the 80th Congress which begins in January.

Tax

Congressional and Treasury tax specialists are continuing their labors in preparation for the return of the Ways and Means Committee at the time hearings resume on November 4. Chairman Harold Knutson of Minnesota has conferred with the special committee headed by former Treasury Assistant Secretary Roswell Magill—who, together with Treasury tax men, has indicated support for the "community property" principle. As now planned, the hearings which begin November 4 will run for about three weeks with attention given to tax-free cooperatives and pension trusts. The Ways and Means Committee may change this program after they meet.

Indications are that tax revision in the 1948 session will be under two bills, (1) a general reduction of personal income taxes, similar to the bill which was twice vetoed during the first session, together with a national "community property" provision, and elimination of estate tax disadvantages in the present community property States; and (2) general tax revision, consideration of reduction in excise taxes, relief from double taxation on corporate income, and consideration of administrative and technical amendments.

Foreign Trade Agreements

Factual information on the Geneva Trade Conference is scarce. It is reported that between 70 and 80 new tariff agreements are "practically" completed and that all negotiations may be completed by mid-October. United States negotiators are reported to have reached agreements with Norway, Cuba, China, Belgium, Netherlands and Luxembourg. London reports state that U. S. and British negotiators have slowed down their work due to U. S. rejection of the British offer of reductions of only 5 to 20 per cent on certain items of imperial preference. The whole structure of the Geneva Conference seems to hang on whether the U. S. and Britain will reach a tariff accord.

Freight Rate Hearings

Beginning September 9, the I. C. C. has conducted hearings on the railroads' petition for an immediate increase of 10 per cent in all freight rates to tide them over until commission action is taken on the general 16.7 per cent increase discussed in a previous issue. The I. C. C. has divided the freight rate case into two parts, (1) a hearing on the immediate 10 per cent rise, and (2) a hearing on the long range demand for an average 27 per cent increase.

Washington Highlights

WHITE HOUSE: Tussling with foreign relief and domestic prices.

TAX: Hearings resume November 4.

TRADE AGREEMENTS: Geneva battle continues.

FREIGHT RATES: 27% increase asked.

METAL PREMIUMS: Considered at Western hearings.

RFC: Still considers mine loans.

STOCKPILE: Bids asked on metals.

TAFT-HARTLEY ACT: Courts make decisions.

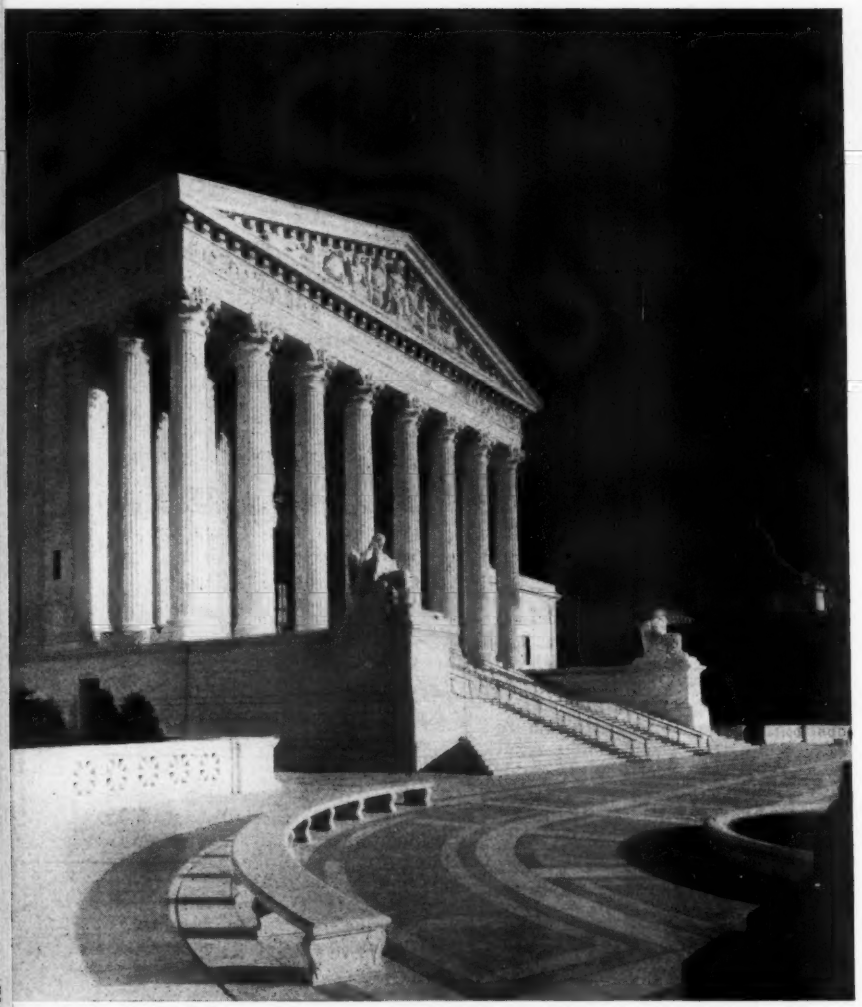
WAGE-HOUR: Hearings to resume.

Speaking for the iron ore producers of the Lake Superior District, Vice President Harrison of the Hanna Ore Mining Co. stated that shippers in that area find no reason for any increase in ore rates. It was shown that operating income on iron ore railroads indicates no need for an emergency rate raise.

Premium Price Plan

At the House Small Business Subcommittee hearings in Seattle and Reno, September 8 and 15, a division of opinion was expressed over continuation of mineral subsidies similar to the Premium Price Plan. One witness from northern Idaho called for assistance to encourage exploration and development of base metal ores, the metal to go into the national stockpile; he urged that operating subsidies not be renewed, and exploratory and development aid be continued for three years. Another recommendation called for tax exemption for small producers for the first three years and until profits exceed $10,000.

Exploration assistance through RFC loans, to be repaid only from production when attained, was advocated by Leverett Davis of the Callaman Zinc and Lead Co. Quicksilver producers of California, Oregon and Nevada made a vigorous presentation of the present plight of their industry, due to heavy importations from Spain and other countries.



The United States Supreme Court

Liquidation of the Office of Premium Price Plan is being accelerated but Director C. O. Mittendorf has stated that every effort will be made to process unfinished business.

RFC Mining Loans

The Reconstruction Finance Corporation announced September 2 that it is continuing to receive and consider mining loan applications. Congressional repeal of Section 14 of the RFC Act had led many to believe that mining loans had been discontinued. This section, originally placed in the law by former Senator Key Pittman of Nevada, authorized development loans for gold, silver, tin and strategic minerals.

The RFC announcement sounded the warning that mining loans "must be of such sound value or so secured as reasonably to assure retirement or repayment. The applicants must also certify that credit is not otherwise available on reasonable terms."

Meanwhile the Senate Committee on Banking and Currency plans an investigation of the RFC including its activities in connection with stockpiling of strategic and critical materials.

Stockpile Bids

Early in September the Treasury Department's Bureau of Federal Supply sent out inquiries to producers of zinc, copper and lead for bids on furnishing metal for the national stockpile. It is understood that bidders are required to certify that metal offered to the Bureau of Federal Supply has been offered for sale to at least three consumers who refused to buy. It is also understood that the contract form used by the Bureau stipulates that if market prices drop, undelivered metal will be received only at the lower price. Inquiries have also been issued for bids on cadmium in ingot or slab and for bismuth.

Taft-Hartley Act

Although the protests by union labor leaders against the Taft-Hartley Act have had wide publicity since its enactment, recent polls indicate a turn in sentiment toward the viewpoint that the Act should be given a fair chance to operate before any serious thought is devoted to its amendment. In a test case, the U. S. Court of Appeals ruled September 29 that benefits of the National Labor Relations Act are specifically denied to union foremen by the Taft-Hartley Act. The NLRBoard, in its first decision since passage of the Act, dismissed the complaint of a foremen's union that a company refused to bargain. Likewise a U. S. District Court in Texas in mid-September upheld the law's anti-Communist affidavit requirement.

General Counsel Robert N. Denham of the NLRBoard has stood firmly on his ruling that national labor leaders must furnish the anti-Communist affidavits. Because of the internal strife within the AFL and CIO over furnishing the affidavits, Denham has extended the filing date until October 31, by which time the union leaders may have been able to resolve their internal differences at their national conventions. The executive council of the AFL would have complied with the Denham ruling, but UMW John Lewis held out and thus far has prevented all AFL affiliates from having their cases processed by the NLRBoard.

Wage-Hour Hearings

Although the House Labor Subcommittee hearings on amendment of the Wage-Hour Act, tentatively scheduled to begin October 20, may be delayed, it is anticipated that hearings will be under way by early November. Subcommittee Chairman McConnell (Rep., Pa.) has stated that there is now sufficient testimony on the question of increasing the minimum wage from 40 cents per hour to 60 cents or higher. The "overtime-on-overtime" issue is expected to be presented as well as the matter of extended coverage rulings which have brought certain retail dealers under the Act. It is also anticipated that the Congress will be urged to define the term "regular rate" to mean an agreed upon straight-time rate for time workers, and straight-time earnings for employes paid on some other basis; bonuses and premiums paid for overtime to be specifically excluded from the term "regular rate." Other amendments would call for exemption of highly paid salaried workers from the overtime requirement of the law and for Congressional definition of all terms used in the Act.

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Personals

L. G. (Lafe) Johnson, of Baxter Springs, general superintendent of the Federal Mining and Smelting Company in the Tri-State mining field, has announced his retirement, effective September 30, after 42 years' service with the company and its parent affiliation—the American Smelting and Refining Company. **J. E. Berg**, of Wallace, Idaho, general manager of the company, announced **Ward C. Ball** as Johnson's successor in the Tri-State district. **Ellis A. Robinson** has been named assistant district superintendent. Both Ball and Robinson live in Baxter Springs.

Dr. Charles F. Winans, chemical director of the Pennsylvania Coal Products Department of Koppers Company, Inc., since last January, has been named to the position of plant manager, **C. F. Hosford, Jr.**, Koppers' vice president, announced September 11. In his new position Mr. Winans will be in complete charge of the Petrolia plant and its laboratories, and will direct its research and development operations. Mr. Hosford will continue as general manager of the department.

Wray D. Farmin, president of the Northwest Mining Association, announced recently the appointment of **Roger O. Oscarson** as general manager of the association. Under Mr. Oscarson's management it is planned to expand considerably the activities of the organization. Mr. Oscarson is a mining engineer with a wide knowledge of metal mine development and production in the Pacific Northwest and British Columbia, having practiced in Spokane since 1930. During the war he was with the mining section of the War Production Board, and since has been in charge of commercial construction permits in the Federal Housing Administration.

Edward H. Greenwald, who has been mining engineer for the Boone County Coal Corporation, Sharples, W. Va., has been promoted to the position of assistant to the general manager as of September 1, 1947. Mr. Greenwald, a graduate of the University of Pittsburgh, has been with the company since 1942.

Philip L. Ray, president of the trustees, Great Northern Iron Ore Properties, St. Paul, Minn., has announced that **Wilfrid E. Rumble**, general counsel for the trustees, who has also been serving as secretary, resigned as secretary, and that **Robert A. Dudley** has been elected to fill his place in the secretarial position. Mr. Rumble will continue as general counsel.

Col. Robert Koenig, president of the Ayrshire Collieries Co., has been named chairman of the mineral resources subcommittee of a "nonpartisan committee of distinguished citizens" formed to study the ability of the United States to meet demands for goods for export to aid in implementing the Marshall Plan for Europe. Announcement of the committee was made recently by Averill Harriman, Secretary of Commerce.

Col. Koenig

Landon Strobel, who was secretary of the Premium Price Plan for copper, lead and zinc throughout the period of the war and to June 30, 1947, will be making his home at 42 Ardmore Road, Berkeley, Calif., after October 1.

John S. Wells, superintendent, Maitland mine, Coal Division, Eastern Gas & Fuel Associates, Maitland, W. Va., has been named general superintendent of the company's new mine at Wharton, W. Va. **E. B. Taylor**, from the company's Pittsburgh office, replaces Mr. Wells at Maitland.

Charles Hardy, Inc., of 420 Lexington Avenue, New York 17, have announced the election as a director of **Charles J. Hardy**, a graduate of Harvard and son of the late Charles Hardy, founder of the company and a pioneer in the field of powder metallurgy. At the same time the company has elected **Harold C. Miller**, a graduate of the Missouri School of Mines and Metallurgy, vice president in charge of engineering.

Additional appointments to the staff of the Research and Development Division of Pittsburgh Consolidation Coal Company were announced in September by **Dr. Howard S. Turner**, assistant director of the division. **R. V. Safford** will be in immediate charge of the company's coal gasification pilot plant at Library. For the past four years he has been with the Stanolind Oil and Gas in complete charge of the construction, maintenance and operation of the Synthol pilot plant at Tulsa, Okla., developing the Fischer-Tropsch (gasoline from natural gas) process. **Thomas G. Reynolds** was appointed chemical engineer on coal gasification. Messrs. Reynolds and Safford are both assigned to the development department under **W. D. McElroy**, manager.

Henry B. Van Sinderen has resigned as chairman and director of the Callahan Zinc-Lead Company.

Robert Estill, of H. C. Frick Coke Co., has been sent to Germany to supervise the rehabilitation of the Ruhr coal fields. He will be gone about 18 months.

On September 2, **Dr. C. H. Mathewson**, Professor of Metallurgy at Yale University, was elected to receive the gold medal of the American Society for Metals for 1947. According to the announcement by W. H. Eisenman, national secretary of the society, the A. S. M. gold medal is awarded "for outstanding metallurgical knowledge and great versatility in the application of science to the metal industry, as well as exceptional ability in the diagnosis and solution of diversified metallurgical problems." Award of the medal will be made in Chicago in October at the annual banquet of the A. S. M., held as an important event of the National Metal Congress and Exposition.

Charles Dahlberg has accepted the position as mill superintendent for the Rico-Argentine Mining Company at Rico, Colo., the largest zinc producing operation in the state at the present time. He is well known in Colorado mining circles as he has been engaged in mill operations for some years throughout the state. He formerly made his residence at Clear Creek, Colo.

Promotion of three top operating officials has been announced by the Hanna Coal Co., St. Clairsville, Ohio. **James Hyslop**, formerly vice president in charge of operations, has been named executive vice president of the organization. **James D. Reilly**, gen-

eral manager of underground mines, has been named to succeed Mr. Hyslop as vice president in charge of operations. Mr. Reilly was promoted from mine superintendent to general superintendent of Piney Fork No. 1 and Dun Glen No. 11 mines in 1945 and was made general manager of underground mines late in 1946. **Norman Prudent**, formerly production engineer, has succeeded Mr. Reilly.

Fred Humphrey, geologist for the Nevada Bureau of Mines, has spent the summer in the Hamilton district of Nevada, mapping formations from aerial photographs supplied by the U. S. Geological Survey.

It has been announced by **George F. Campbell**, president of the Illinois Coal Operators' Association, that **J. Roy Browning**, formerly president of the Freeman Coal Mining Company, has been elected to the position of vice president and labor commissioner of the Illinois Coal Operators' Association effective September 1. Mr. Browning will devote his entire time to the work of the association. He is an attorney as well as a practical coal man. **Fred S. Wilkey** will continue his usual duties as secretary of the Illinois Coal Operators' Association.

Robert J. Davis, labor relations assistant for American Potash & Chemical Corp., Trona, Calif., has resigned to take a position as assistant personnel director at the atomic energy project, operated by the University of California at Los Alamos, N. Mex.

President **Whitney Warner, Jr.**, of the Warner Collieries Company, has announced that **W. F. Wolfe**, who has been general manager and superintendent of Warner's West Virginia mines, has been elevated to the post of vice president and general manager of their West Virginia operations. Mr. Wolfe was general superintendent for Kanawha & Hocking Coal & Coke Company when the Warner Collieries acquired the mines early in 1946. For the past 10 years Mr. Wolfe has been director of Kanawha Valley Mining Institute and its president in 1941. Simultaneously, Mr. Warner announced the appointment of **Lee Morris** as assistant to the president in charge of planning and development of Ohio and West Virginia operations. Mr. Morris has resigned as head of the Department of Mining and Geology at West Virginia Institute of Technology to accept his new post.

Pierce C. Walker, mining engineer and metallurgist, has joined the staff of the Nevada Equity Mining Co., at Austin, Nev., where he has recently taken his family.

1948 Coal Convention Plans Underway

THE American Mining Congress takes pleasure in announcing that T. G. Gerow, Executive Vice President of Truax-Traer Coal Company, has accepted the National Chairmanship of the Program Committee for the 1948 Coal Convention. This is to be held at the Netherland Plaza Hotel, Cincinnati, on April 26-27, 1948, and will be a Convention only, without exhibits of mining equipment.

T. G. GEROW

Mr. Gerow, having a wide experience in both deep mining and strip mining, is highly qualified to direct the planning for this important meeting. He will be assisted by a Program Committee of operators and manufacturers representing all branches of the coal mining industry. This Committee, whose personnel will be announced later, will meet in the near future to formulate the Convention plans and to select the subjects and speakers for the sessions.

Robert C. Pruess, formerly mine superintendent for the U. S. Vanadium Corporation in Peru, has been appointed chief engineer of Sidney Mining Company. He will be in charge of underground mining and development at the company's property in the Pine Creek district near Kellogg, Idaho.

A. G. Gossard, of the Pittsburgh Consolidation Coal Co., has been named general superintendent, Union Colliery Co., Dowell, Ill. He succeeds **John Harvey**, acting superintendent since the retirement of **Edward A. Leming**, who resumes his position as construction superintendent at the New Kathleen mine.

— *Obituaries* —

Earle W. McMullen, director of research for the Eagle-Picher Company, and prominent in engineering chemistry, died at 5:45 p. m. on August 26 at the Mt. Carmel Hospital in Pittsburg, Kans. Mr. McMullen was 60 years old and was widely known for his chemical research. Pigments had claimed Mr. McMullen's interest for many years. He pioneered in water emulsion paints for coating industrial products.

Wm. Blair Baggaley, Galena, Ill., president of the Northwest Zinc Co., died Thursday, August 28, in the Wesley Memorial Hospital in Chicago. Funeral services were held August 30, with burial in Mt. Hope Cemetery, Chicago. Graduating from the Michigan College of Mining and Technology class of 1911, with the degree of mining engineer, Mr. Baggaley entered an active and successful career in zinc mining in southwestern Wisconsin and northern Illinois. He was also a director of the International Mining Corp.

Roy Handy, who was superintendent of the roaster division of the basic magnesium calcining plant at Gabbs, Nev., died recently after a long illness in Santa Rosa, Calif.

Howard R. Downing, 30, superintendent of the basic branch of U. S. Vanadium Co., drowned July 31 while swimming at the Vegas Wash bathing beach, near Las Vegas, Nev.

Marion Plaskett, 91, one of the early mine developers of Monterey County, Calif., died recently in San Luis Obispo and was buried at Salinas. For over 20 years he operated the Hollyberry Mine in the San Simeon district.

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ABOUT MINING AND MINERS

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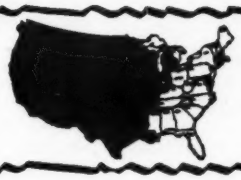
NEWS and VIEWS



Alabama Furnace Closes

Republic Steel Corp. announced that it has taken out of blast its furnace at Gadsden, Ala. The furnace had been producing pig iron for the Federal Housing Administration during recent months. Built by the Defense Plant Corp., the furnace has been operated by Republic for the United States since 1942. About 50 men normally employed to operate the furnace will be offered other employment at Republic's Gadsden plant, the company said.

Coal Association Grants Scholarships

The West Virginia Coal Association has created a series of West Virginia University scholarships in coal mining engineering on which it will spend $5,000 a year for each of the next five years, President Irvin Stewart of the university announced recently.

President Stewart said details governing the annual awards have been worked out by university representatives and L. Ebersole Gaines of Mount Hope, president of the coal association. For 1947, there will be eight scholarships, each with a value of $625, which will be paid in nine monthly installments during the school year.

During the five-year period, the awards will be made to residents of West Virginia only and will be confined to students in the field of coal mining engineering.

Applicants must not have reached their 21st birthdays at the time the applications are submitted unless they are then enrolled in an accredited university or college. The age limit in the latter case is 23. A further provision requires that all applicants must submit written evidence from a physician that they are physically fit to enter mines and to perform the duties of a mining engineer, supervisor or manager.

Recipients of the scholarships will be selected by the university board of governors upon the recommendation of the faculty of the School of Mines on the following basis: (1) scholarship, (2) extra curricular activities, (3) personality, and (4) aptitude for scientific and engineering work as demonstrated by special qualifying tests to be provided by the School of Mines.

B. & O. Places New Orders

The Baltimore and Ohio Railroad has recently purchased 13 big mountain type locomotives from the Boston and Maine Railroad. With 67,000 lb. tractive power, 73-in. drivers and a tender capacity of 21 tons of coal and 20,000 gallons of water these locomotives compare favorably with the mountain type power now in use on the B. & O.

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Work Under Way in the Quebec Iron Ore Field

Labrador Mining & Exploration Co., Ltd., is operating diamond drills in its Far North iron ore exploration on a large area in Quebec and Labrador. The drill equipment and supplies were flown in several months ago. The work is dependent on air service. The Canadian Government is expected to construct an airport in New Quebec, near the Labrador boundary, which would greatly extend the working weeks in the short operating season for this remote iron ore field. A crew was flown into the Ruth Lake area of Quebec early this year to prepare a landing on Knob Lake, near the Ruth Lake iron ore deposit. A second crew followed later to erect five 20 x 48-ft. Quonset huts.

Miners Presented in Broadcast

As the highlight of the annual Ohio Miners' Safety and Accident Prevention Meet held recently at Dillonvale, Ohio's "15 most promising young miners" made their bow to packed stands in a radio broadcast over a mobile unit of Station WWVA, Wheeling.

The 15 young miners, singled out as a symbol of the progressiveness and enthusiasm of the 1947 coal industry by Ohio newspaper columnist "Hi Waters" McWilliams, also editor of the Hanna *Coal News*, are all high school graduates who have elected coal mining as a career. They are: George Kanopsic, Brinley Allen and Louis Murie, Jr., of the Hanna Mines; Paul Fillipovich and Steve Torok, of the Y. & O. Coal Co.; John Kochan and Alfred W. Knight, of the Warner Collieries; Roy Richardson and George Brkich of Powhatan; Walter Goga of the David Z. Norton Co.; James O'Grady of Rail & River Coal Co.; Joseph Kolanski of the Monaco Coal Co.; Charles Young of the Midvale Coal Co.; Edward Requilez of the Lorain Coal & Dock Co., and Herman Perzanowski, Jr., of the Cambria Coal Co. They were interviewed on the air by Cliff McWilliams of the Hanna Coal Co. and Adolph Pacifico, vice president of District 6, UMWA.

Winner of the safety contest, in which 13 teams competed, was the Midvale Coal Company's crack entry, with the team from the Piney Fork No. 2 Mine of the Hanna Coal Co. in second place. A feature of the contest was the participation of a women's first-aid team from Nottingham County. This team, which finished first in point scoring, received a prize award donated by the National Coal Association.

At the conclusion of the meet, the Holmes Safety Award was presented to George Chamberlain, 77 years old, of Dillonvale. Chamberlain worked in the mines 65 years without an accident. The presentation was made by Chief Judge George W. Grove, supervisor, District A, U. S. Bureau of Mines, Pittsburgh, Pa.

Seven Teams Compete at Safety Meet

The 17th Annual Safety Day and First Aid Meet of the Mining Division of the American Rolling Mill Company was held at the Highland Country Club, near Nellis, W. Va., on Saturday, August 23, 1947. Seven teams competed representing the various mines at Nellis, Montcoal and Stickney.

Team No. 2 of Nellis, won first place in the meet with a perfect score of 500 points.

Team No. 4 of Nellis, was second with a score of 499½ points.

Team No. 6 of Nellis, placed third with a score of 498⅔.

Team No. 1, Montcoal-Stickney, was fourth with a score of 493⅓.

Team No. 3—girls team from Montcoal-Stickney—was awarded first place in their division with a score of 499½.

Team No. 7—Nellis girls team—was second with a score of 498⅓.

Team No. 5, Boy Scout team of Nellis—placed third with a score of 494⅔.

The director of the meet was James H. Forgie, safety engineer of Armco. The chief judge was C. E. Linkous, of U. S. Bureau of Mines, Beckley, W. Va.

A full day of sports, events, games, fireworks and dancing, was enjoyed by a crowd of about 4,000 people. An interesting demonstration of Chemox breathing apparatus was given by a representative of the Mine Safety Appliances Company, Pittsburgh, Pa.

Bricks from Fly Ash and Slag

A process for the utilization of fly ash and slag in the manufacture of bricks has been developed by the New Jersey Ceramics Research Station at Rutgers University. The fly ash is obtained through the use of industrial smoke stack precipitators and the slag from furnaces which burn powdered coal. The new type brick is said to be stronger than the average clay brick and its production should be considerably less expensive as the necessary fly ash and slag can be procured more cheaply than clay.

The fact that the raw material for these new bricks will be supplied by

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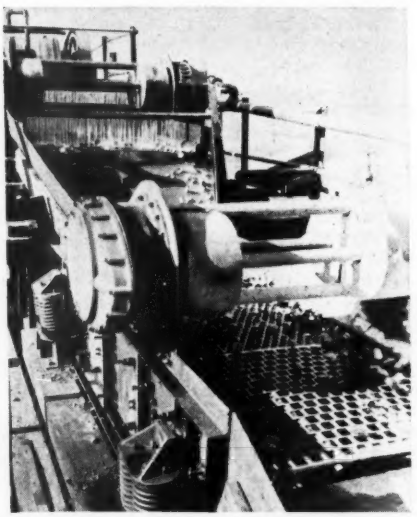
on ROBINS ELIPTEX SCREEN

Here is a Robins Eliptex Vibrating Screen equipped with a Hendrick perforated metal deck. The three-way motion of this well-known screen, plus the accuracy of Hendrick perforations, assures sharp sizing, high capacity and freedom from blinding.

Toughened by an exclusive Hendrick heat-treatment process, Hendrick perforated metal plate withstands abrasion and maintains uniformity of mesh throughout unusually long service life. It is furnished in any desired gauge and size of openings to meet specific requirements. Write for detailed information.



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industrial plants located in cities where most of the bricks will also likely be used would seem to indicate that new plants for their manufacture will probably be built in metropolitan areas. The sponsors of the new process state that equipment in plants now producing clay bricks can also manufacture the new bricks with their present equipment.

New Ohio Strip Mining Law

The General Assembly of the State of Ohio has approved legislation regulating the strip mining of bituminous coal. The act becomes effective January 1, 1948.

Strip operators will be required to obtain annually a $50 permit from the Division of Mines. In addition, a performance bond must be posted with the Division of Mines at the rate of $100 per acre for the land the operator estimates will be stripped in the ensuing year. Liability under such bond will continue for the duration of the particular operation and for five years thereafter, unless released by the Division.

To obtain a release of bond, strip operators are required by the Act to do the following:

1. Cover the exposed face of the unmined coal at the base of the pit with overburden to a depth of at least 3 ft.
2. Seal off with an earth fill any break-through to underground workings in the coal.
3. Provide access roads and fire lanes on the areas of land affected for the purpose of the prevention and suppression of fire in accordance with a prescribed plan approved by the state forester.
4. Level off all peaks and ridges of spoil banks to a minimum width of 15 ft. cross section.
5. If drift mining is to be continued at the premises, these locations must be designated and it shall not be necessary to replace the overburden on the haulage way to the coal until such mining is completed.
6. Within one year after strip mining operations on the premises are terminated, the operator shall plant trees, shrubs or grasses upon the land affected at a cost not in excess of $50 an acre. The planting must be done in accord with a plan approved by the director of the Ohio Agricultural Experiment Station and designed for soil building, erosion control, water conservation or flood control as best determined by the director. All required planting shall be done in the normal planting season with reasonable diligence by the operator. In cases of forest planting, the operator may elect the type of tree and decide whether the future use is to be for lumber, pulpwood or some other purpose. The trees, shrubs or grasses are to become the property of the land owner unless otherwise agreed.

The operator must file a detailed planting report and within one year the director shall inspect the premises. If the work has been done in a workmanlike manner and in accordance with the recommended plan, the director shall certify performance and recommend a release of bond.

Assurance that the conservation plan will be carried out seems to be guaranteed by the additional requirement that the bond per acre shall be raised to $200 upon filing of an annual report of the exact extent of stripping accomplished during the year or upon completion of the operation if prior to that time.

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Consulting Engineer
Mine Mechanization
Mine Management
Oliver Building **Pittsburgh, Pa.**

AMERICAN MINING CONGRESS—COAL DIVISION

Meets in Pittsburgh, November 17, 1947

THE Coal Division Committees of the American Mining Congress will hold their annual conference at the William Penn Hotel, Pittsburgh, on Tuesday, November 17. This will be a one-day business meeting—starting with a morning session at 10 o'clock, continuing with a luncheon meeting at noon and concluding with an afternoon session. Operators and manufacturers, whether or not members of the Committees, are cordially invited to attend.

Following past custom all Committees will meet together in general assembly, to correlate the studies which they are making on various phases of mine operation. Each Committee will submit its report and will lead the discussion on its own subject, but the Conference will be an open forum where everyone present will have the opportunity to take part by offering criticism or suggestions, both as to the actual data presented and as to how these studies can be made of greater service to the coal industry. The reports will be presented in preliminary form, for approval by the Conference or for such revision as may be recommended; advance copies will be available for those who wish to study and discuss the data submitted.

Subjects of maximum importance to the industry will be covered. These include—

- Coal mine haulage with mine cars and belt conveyors
- Pillar extraction under various classes of mine roofs
- Full-seam mining to recover higher percentages of coal
- Reducing fuel losses in mine waste and rejects
- Roof rock study to prevent falls
- Underground power use and transmission

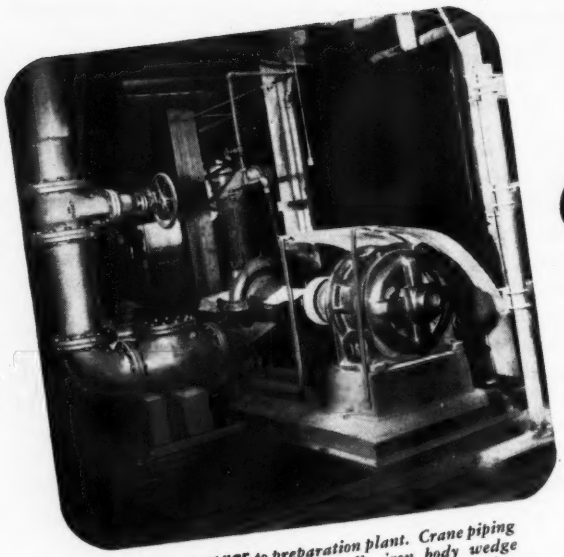
The reports, when completed and approved, are presented to the industry through publication in MINING CONGRESS JOURNAL. Representing the thought of experienced men, they have direct application to problems of mine operation. However, those who prepare the reports receive a far greater value than those who only read them; the conference is an opportunity for operators and manufacturers not now on a Committee, to take advantage of participation in the Committee work, and the American Mining Congress invites all who are interested in these subjects to come to the meeting on November 17.

To Mine More New York Talc

The rich deposits of talc in northern New York are due for more intensive mining.

R. T. Vanderbilt Co., Inc., plans production of 2,500 tons of talc daily in this area, the company said recently, announcing that it had awarded a contract for construction of a mill near Fowler in St. Lawrence County.

This marks the initial entry of Van-



WATER SUPPLY SERVICE *to preparation plant. Crane piping on centrifugal pump includes 125-lb. iron body wedge gate valve with non-rising stem, and swing check valve.*

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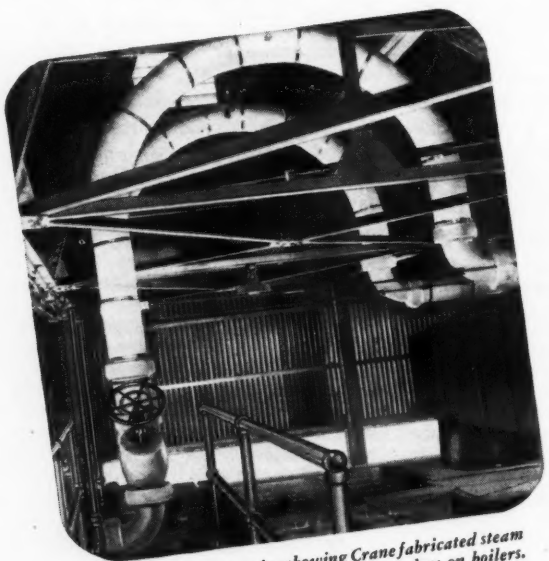
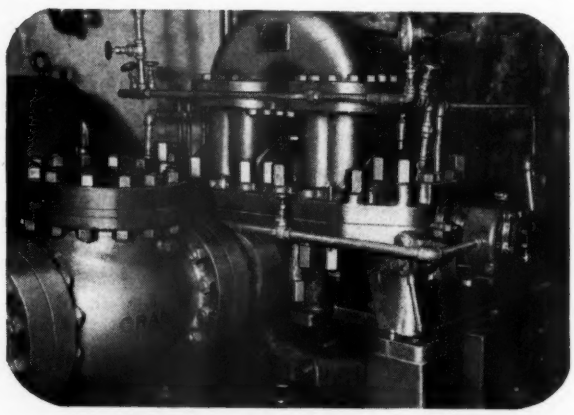


POWER PLANT *in a zinc mine showing Crane fabricated steam header piping and Crane steel stop-check valves on boilers.*



DE-WATERING PUMP *on the 23rd level of copper mine, with Crane high pressure swing check valve in 8-in. outlet line. Small brass valves, fittings, and gauge also from Crane.*

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FITTINGS
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PLUMBING
AND
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derbilt into the talc producing field in this area. The company specializes in the manufacture and technical selling of chemicals and minerals.

Development plans for the Vanderbilt mine call for the sinking of a vertical shaft to a minimum depth of 800 ft. When the mill is completed, the company will process the talc under new production techniques.

The talc deposits are among the largest in the world. One of the largest uses of talc is in the paint industry. It is also used in the production of ceramics, rubber and paper. A relatively small amount figures in the production of cosmetics and talcum powder.

National Steel to Develop Coal Mine

Plans of National Steel Corp. to open a new coal mine near Morgantown, W. Va., were announced September 8.

The new operation will be known as the Weirton Mine. It will be completely mechanized and will be devoted exclusively to the production of metallurgical coal for the Weirton Steel Company, a division of National Steel Corporation. The Weirton Mine tract includes more than 10,000 acres of coal land located in Monongalia County within six miles of Morgantown.

Thomas E. Millsop, president of Weirton Steel Co., and vice president of National Steel Corp., stated that the mine is expected to be in operation by 1950. Development of the mine and installation of plant and equipment will proceed during the interim. It is estimated that the cost of buildings and equipment will exceed $5,000,000.

Present plans call for an initial working force of 500 employes and the production of approximately 1,000,000 tons of coal per year. It is intended ultimately to increase the number of employes to 750 and production to 1,500,000 tons per year.

Company officials point out that it will be impractical to operate the mine to its potential capacity immediately because of channel and lock conditions in the Monongahela River. For some distance downstream from the Weirton Mine's location, the river channel has a maximum depth of 6 ft., which is insufficient to permit the movement of fully loaded barges. For this reason, barges will be half-loaded at the Weirton Mine, then taken for full loading to the company's Isabella Mine, which is on the Monongahela River near Brownsville, Pa.

When channel and lock improvements are made officials say, barges will be fully loaded at the Weirton Mine for direct transportation to the plants of the Weirton Steel Co. at Weirton, W. Va.

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A great example of painstaking research for mine safety is that of the Edison Electric Cap Lamp, invented by Thomas A. Edison. Born of the famous inventor's genius, developed by years of patient effort and perfected through practical mine experience, the Edison Electric Cap Lamp provides *unfailing light* at the working point . . . brilliant, directed to the job, always dependable.

Of the same basic character is M.S.A.'s own research. Instigated by the need for ever more effective mine safety equipment, our Laboratories engage in a never-ending program of product design development, improvement, and quality control. *M.S.A. leads in safety research, and in safety equipment manufacture.*

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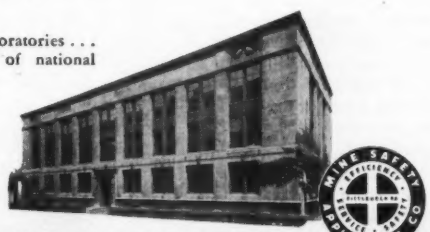

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Coal Gasification Pilot Plant

The Research and Development Division of Pittsburgh Consolidation Coal Co. announced recently that contract for the design and construction of its coal gasification pilot plant has been awarded to Chemical Plants Division of Blaw-Knox Company.

This pilot plant is a cooperative project sponsored jointly by Standard Oil Development Company and Pittsburgh Consolidation Coal Company. The purpose of the plant is to ascertain whether a practical and commercial process can be found for making synthesis gas, a first step in producing synthetic fuel from coal.

Present estimates indicate the cost of the pilot plant will be in excess of $500,000. It will be located at Library, near the coal company's research center.

The pilot plant will be a completely integrated and continuous processing unit, the heart of which will be a synthesis gas generator, a cylindrical column supported by a steel structure about 80 ft. high.

The pilot plant will generate approximately 1,000,000 cu. ft. of synthesis gas per day.

According to Blaw-Knox Co., construction work is expected to begin later this year.

Canadian Nickel and Copper Near Pre-War Output

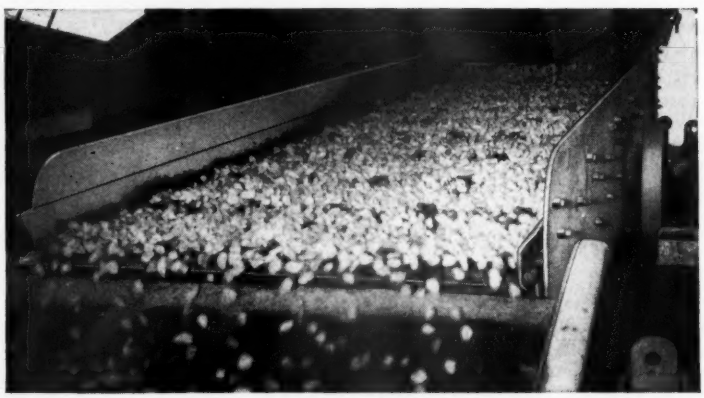
During the first six months of this year, copper and nickel in all forms have continued their steady march back to pre-war standards of production in Canada, according to reports of the Dominion Bureau of Statistics.

Although the June output of copper dropped to 19,726 tons, compared with 20,432 in May, copper production rose sharply over 1946, when June output was 14,992 tons. During the first half of 1947, a total of 110,393 tons was produced as against 91,244 tons in the similar period of the previous year.

Nickel production fell slightly in June, with 9,835 tons being reported, compared with 9,885 in May and 7,594 in June of last year. The total nickel output for the first half of 1947 was 58,051 tons, compared with 45,176 in the like period of 1946.

Exports of copper in ore concentrates and matte in June amounted to 2,625 tons, compared with 2,145 in the preceding month. Copper ingots, bars, slabs and billets exported in June showed a sharp decrease, with only 7,934 tons shipped as against the export of 10,589 tons in May. Exports of nickel amounted to 9,994 tons compared with 13,877 in May.

Long Life . . .



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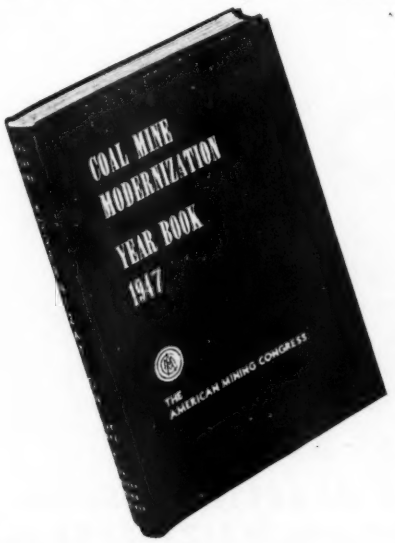

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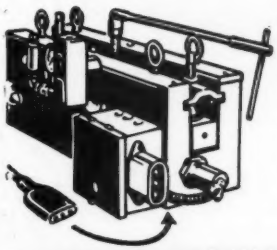

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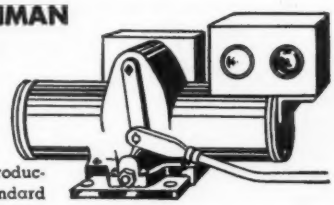

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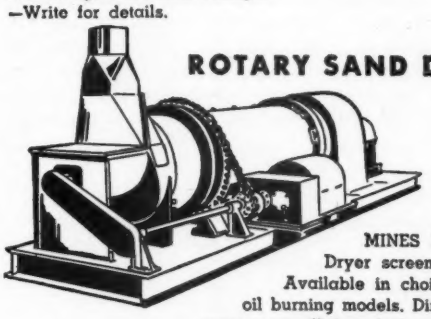

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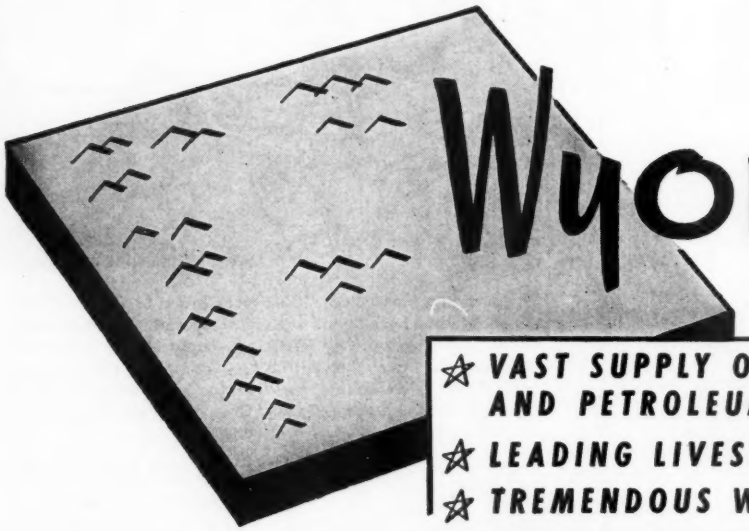
TREASURE MAP OF INDUSTRY



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- ☆ OUTSTANDING SCENIC AND RECREATIONAL ATTRACTIONS
- ☆ HEALTHFUL LIVING CONDITIONS

One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.

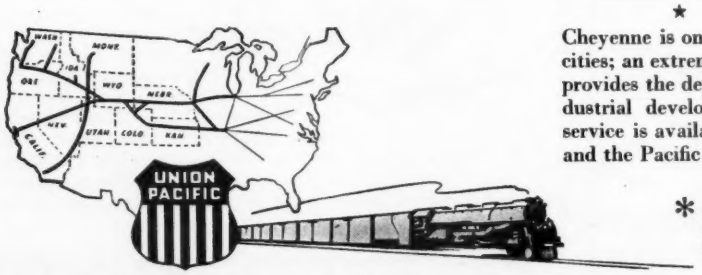
In Wyoming manufacturers will find a vast amount of raw materials. It is a leading state in potential mineral resources; produces great quantities of iron . . . has the world's largest untapped supply of coal. Copper, silver, gold, lignite and bentonite are among the mined metals and minerals. The State contains 27 oil fields and large timber lands.

Wyoming is one of the greatest of livestock States, producing fine beef cattle. Its wool clip is tremendous. Poultry raising and dairying are important activities. Principal crops are sugar beets, potatoes and grains.

The healthful climate . . . scenic and recreational attractions such as Yellowstone-Grand Teton National Park and scores of dude ranches . . . a fine educational system . . . are incentives to living in this western region.

★ ★ ★ ★

Cheyenne is one of the principal Union Pacific mainline cities; an extremely important point to the railroad which provides the dependable transportation so essential to industrial development. For travelers, daily Streamliner service is available from Cheyenne to and from Chicago and the Pacific Coast.



* *Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebraska, for information regarding industrial sites.*

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Central States

Phosphate Called Vital

Phosphate was recently described by Louis Ware, president of the International Minerals and Chemicals Corp., as one of the most important supplies needed by war-torn countries to speed their economic recovery. Mr. Ware returned recently from a six-week tour of Europe.

"Phosphate is one of the most needed items to allow the European countries to build up the soil which was depleted during the war in order to attain maximum farm production," said Mr. Ware. "Food is what they all need and phosphate means more food."

Although this material is needed for the soil, he emphasized that countries such as Germany also were faced with other major barriers preventing a higher level of food production and distribution.

Mr. Ware said that the world's annual production of phosphate, which is falling short of meeting the total demand, would amount to about 14,000,000 tons this year and in 1948. Of this yearly output, he said, the United States would account for about 7,000,000 tons, which is twice as much as was produced in this country before the war.

Higher Price for Zinc in Tri-State

Effective September 1 the price of zinc concentrates at the Central mill was increased $8 a ton over the previous open market blende price of $64 a ton, it was announced by an official of the Eagle Picher Mining & Smelting Co.

The new $72 a ton price, which is the highest base price in a 30-year period, will be paid on ores treated only over the Central mill. The higher price was set not only to assist the small, independent, marginal ore producer to continue operations but also to encourage the movement of a greater tonnage to the big mill to maintain its concentration efficiency.

New Park on Strip Coal Land

Lee-Sherrard Park is a 609-acre tract of land donated to the city of Linton, Ind., by the Maumee Collieries Co. and the Standard Fourth Vein Coal Co. It contains 27 large lakes. The park, a mile and a half northeast of Linton, now has 8½ miles of roads and bridle trails, an area for horse tracks and other improvements—thanks to 20 men who donated their time and efforts—and thanks to four coal companies which donated valuable equipment.

The 20 men were members of the Linton Community Conservation Club and the four coal companies were: Sherwood-Templeton, Central Indiana, Maumee Collieries Co. and John Michael Coal Co., Inc.

To handle the ambitious road and bridle-trail building and the grading

Parmanco
MECHANICAL FEED
HORIZONTAL DRILL
WITH TRACTION DRIVE

Ten years of field test has proven that our power-feed design of direct, transmission and worm gearing with two-speed control will not only cut shot hole drilling time in half but also eliminates costly maintenance delays. V-belt drive to the power-feed with an additional ample clutch in that assembly gives absolute control of a drilling speed of two to three feet per minute with a retrieving speed of twenty-four feet per minute.

The Parmanco Horizontal is adapted to all forms of high-wall drilling, will handle a six-inch auger up to a distance of sixty feet or more and, by use of our patented augers with interrupted flights and secondary cutters, will drill an absolutely clean hole with a minimum of torque. It permits the drilling of a controlled-angle hole which makes possible a great saving of explosives through the cantilever effect of this controlled-angle drilled hole.

EFFICIENT STRIPPING STARTS
WITH EFFICIENT DRILLING

PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS

program, the companies mentioned donated $100,000 worth of valuable equipment and the "know how" to operate. Equipment used included three bulldozers, one road maintainer, one tractor and two large trucks.

As a result, Lee-Sherrard park now has an inter-twining network of hard-packed roads (5 mi.) and bridle trails (3½ mi.) to add to its already valuable recreational facilities.

Dredge to Strip Iron Mine

The hydraulic dredge, Alice Lorane, has been knocked down and railed from Superior, Wis., to the Cuyuna iron range, where the dredge is being reassembled for its task of stripping the lake bed material from Rabbit Lake, Cuyuna, Minn., to make open pit mining available for Pickands, Mather & Co. On September 3, 40 railroad cars of dredge parts had been hauled to the Cuyuna iron range, with 10 more railroad cars of parts to follow. The Iowa Construction Co. owns the dredge and has the contract to strip off the lake bed material for future mining of the underlying iron ore deposit at Rabbit Lake.

Permit Granted for Iron Search

A permit to explore iron ore in an undeveloped mine a mile east of Chisholm, Minn., has been granted by the Minnesota executive council to Haley & Young of Hibbing. Ray D. Nolan, director of the state lands and mineral division, estimated the mine contains 695,000 tons of iron ore with a possibility it might contain a million tons. The permit was granted to the Hibbing company on a basis of 54 cents per ton royalty.

Morgan to Operate New Strip Mine

A strip coal operation is being developed by Morgan Coal Co. near Marion, Ill., on the No. 5 seam. A complete preparation plant and washery, having a capacity of 2,000 tons per day, is to be constructed. The operation will be serviced by the Chicago, Burlington & Quincy R. R.

Iron Ore Cargo Record

The steamship B. F. Fairless of the Pittsburgh Steamship Co., took a record cargo of iron ore from the ore docks at Two Harbors, Minn., Monday, August 4, of 18,725 gross tons. This is an all-time ore cargo record for the Great Lakes. It surpasses the previous record established by the same vessel, when it took a cargo of 18,598 gross tons of iron ore from the same port June 30, 1945.

Paxson Equipment to be Sold

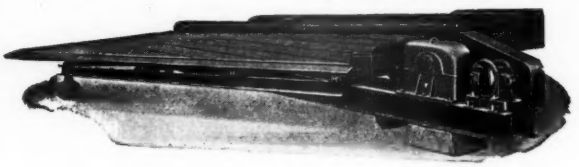
Machinery for the operation of three lead and zinc mines, known as the Paxson Operation, near Baxter Springs, Kans., is being offered by the war assets administration on bids until October 6, the zone WAA real property office announced recently.

Operated during the war for the government by the Eagle-Picher Mining and Smelting Co. of Joplin, the various units cost the government $641,000.

The property is in three leased mines, known as the Paxson, Stoskoff and Swalley, and consists of electrical installations, shaft hoists, compressors, cables, underground cars, tracks, drills and supplies. Sixty per cent of the material is underground, as low as 350 ft.

Extractives Industry Conference

Of interest to coal and metal producers is the annual meeting of the Controllers Institute of America, to be held shortly at the Drake Hotel in Chicago, Ill. An Extractives Industry Conference will be held on Tuesday afternoon, October 21, 1947. This



Super Duty—a Glutton for Feed

SuperDuty users tell us they are amazed at the way their Diagonal-Deck Concentrating Tables gobble up new feed.

The reason for this is found in the small percentage of middlings that must be recirculated. The diagonal deck places approximately 75% more working riffles in the natural path of the pulp. It fans out the material bed so that accurate cutting is made easy. You get higher grade concentrates, cleaner tailings and fewer middlings.

The result—more new feed capacity per day . . . at a lower concentrating cost per ton. For full information about this sensational concentrator, write for Bulletin 118-A.

CONCENCO FEED DISTRIBUTORS

The Concenco Revolving Feed Distributor is a heavily fabricated, all steel machine, built in various types, with motor drive requiring only ¼ to ¾ H.P. in operation. This distributor effects perfectly a splitting of feed sluiced to its revolving cone, into any desired number of equal portions. It is especially suitable for efficiently feeding a battery of coal washing tables, giving an equal distribution of feed to each table.

THE DEISTER ★ CONCENTRATOR COMPANY
917 Glasgow Ave. • Fort Wayne, Ind., U.S.A.
CONCENCO PRODUCTS

★ *The ORIGINAL Deister Company* ★ *Inc. 1906*

conference is an innovation in this year's program.

Speakers will include Henry B. Fernald, of the accounting firm of Loomis, Suffern & Fernald, New York, and F. J. Blaise, manager of the Income Tax Department, The Pure Oil Company, Chicago. Both speakers will discuss accounting and financial problems of interest to the extractives industry.

Exploration Company Sells Out

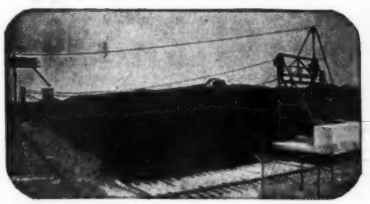
The Seafield Exploration Co., operated by William Seafield at Ironton, Minn., Cuyuna iron range, has sold out its equipment of drills to E. W. Leach of Duluth. Mr. Seafield will retire after his many years as a drill contractor on the Cuyuna range. He has operated on the Cuyuna range from the time iron ore explorations commenced there. Mr. Leach recently entered the contract diamond drilling business as the Leach Exploration Co.

Kansas Mine to Reopen

Messcave Mining Co. is de-watering the old Kursch-Savage mine on the Hubbard land at Badger, Kans. The shaft will be reopened on the 90-ft. level, where lead and zinc ore will be mined.

SAUERMAN

Power Scrapers



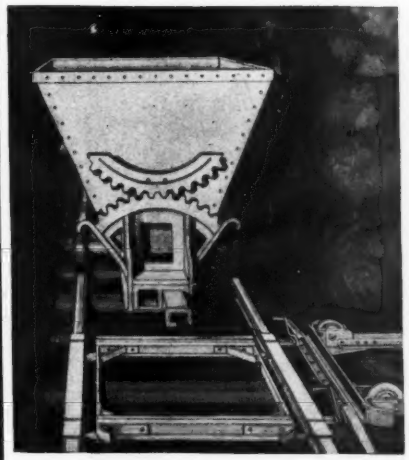
PICTURED above is a typical power scraper installation as laid out by Sauerman engineers for storing and reclaiming large daily tonnages of coal, ore, or other bulk materials.

This Sauerman system, operated by one man, is handling a storage pile 35 ft. high covering 105,000 sq. ft. of ground. Moving material to or from any point in the area, scraper handles an average of 100 tons an hour at a cost of about 3c a ton.

For details of other Sauerman scraper layouts for stockpiling, excavating and strip mining, write for our catalog.

SAUERMAN BROS., INC.
540 S. Clinton St., Chicago 7

THE *Canton Car Transfer*



. . . WILL BY-PASS ONE OR MANY CARS ON A SINGLE TRACK . . .

Making it POSSIBLE TO LOAD AN ENTIRE TRAIN TO BE PULLED OUT AT ONE TIME.

consists of three units, so fitted that they can be installed on a track or removed from the track by two men in two minutes for either operation.

The installation does not interfere in any manner with the regular transportation. No alterations are made to track or rails.

The units consist of (1) a Track Section placed between the rails at the point where transfer is to be made; (2) a Transfer Section extending to the right or left of the track, which accommodates the empty car while other cars are being bypassed and (3) the Truck which rests on the Track Section when a Transfer is to made.

Method of operation. The empty car is pushed into the truck which has previously been locked to the rails. The wheels of car are blocked on the truck and the truck released from the rails is pushed onto the Transfer Section.

The Canton Car Transfer is built to operate on a minimum, 18 inch track gauge and 20 pound rail, to the largest gauge and rail in use.

Truck wheels have Timken Roller Bearings and heavy cars can be moved by two men. Bulletin gives details. Furnished on request. Write today.

The AMERICAN MINE DOOR CO.

2063 Deuber Ave.
CANTON 6, OHIO

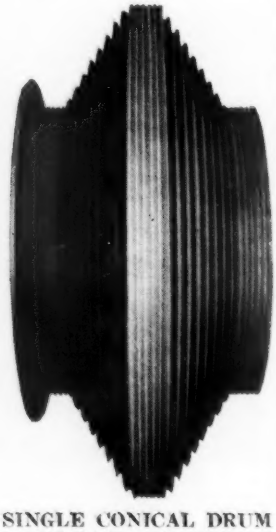
"Raising EFFICIENCY" "Lowering OPERATING COSTS"

Designed after careful time studies of hoisting cycles and practical engineering experience, they have now been proved by years of outstanding performance. Long life is assured by heavy duty construction and unusual rigidity.

Holmes' Winding Drums are designed and custom built in a wide range of sizes and styles, to meet your particular requirements.

SINGLE CYLINDRO CONICAL DRUM 8 FOOT TO 12 FOOT

DOUBLE CYLINDRO CONICAL DRUM 8 FOOT TO 12 FOOT



SINGLE CONICAL DRUM 6 FOOT TO 11½ FOOT

Listed below are a few examples of the tonnages being accomplished with Holmes' Winding Drums

Cars Per Hr. Average	Max.	Coal Per Car	Lift	Power
250	255	7000 lbs.	412 ft.	Electric
250	255	7000 lbs.	462 ft.	Electric
255	260	6800 lbs.	422 ft.	Electric
200	215	6500 lbs.	500 ft.	28″ x 42″ Steam
207	220	6000 lbs.	500 ft.	24″ x 42″ Steam
210	225	5300 lbs.	475 ft.	24″ x 36″ Steam
214	240	6000 lbs.	365 ft.	24″ x 36″ Steam
180	193	8000 lbs.	563 ft.	26″ x 42″ Steam

ROBT. HOLMES & BROS., INC.

DANVILLE, ILLINOIS

Tri-State Mine Closes

Guy H. Waring of Oronogo, manager of the Oronogo Mutual Mining Co., announced September 20 the suspension of mine operations at the company's open-pit mine at Oronogo for an indefinite period.

Waring said that the company, in cooperation with other companies interested in the area, including the Eagle-Picher Mining and Smelting Co.,, American Zinc, Lead and Smelting Co., Paul Childress and Fenix and Sons, would pool their interests in keeping the area de-watered until March of next year to see what happened during the interim.

Air Survey on Mesabi Range

A group of engineers connected with the Aero Service Corp., operators of airborne magnetometer and photography, made a trip over the Mesabi range in northern Minnesota during the late summer. The Aero engineers two years ago conducted some magnetometer work for mineral location in the northern Michigan iron ranges. They also have operated in the ore fields of Labrador and have done airborne instrument flying in some of the Canadian mining districts. Another exploration includes flying a magnetometer in the Bahama Islands, in search of likely places to drill for oil.

ALLISON STEEL MANUFACTURING COMPANY

Mine and Mill Buildings • Mine Rails • Ore Cars • Steel Gallows Frames • Ball Mills Muck Plates • Crucible Drill Steel

• We offer a complete repair service to the Mining Industry. Our new Machine Shop is equipped to handle your work quickly and economically.

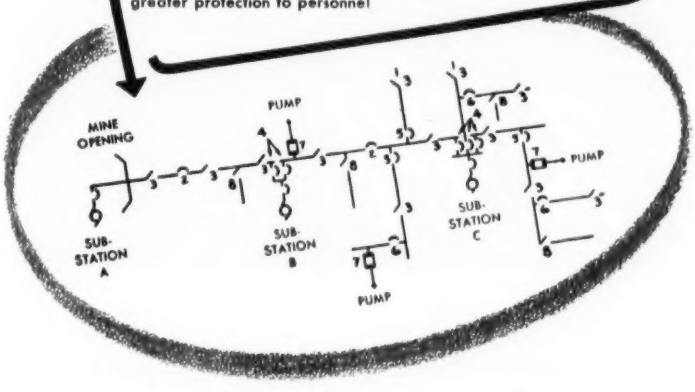
Hot Milling of All Types of Detachable Bits

SOUTH 19th AVENUE
PHOENIX ARIZONA
PHONE 3-5161

Boost Production *Tipple-high-*

APPLY AN I-T-E SECTIONALIZING PLAN LIKE THIS

The diagram below shows a few applications of I-T-E Sectionalizing Switchgear to mine electrical distribution systems. We can offer you many recommendations for raising production levels, and for giving greater protection to personnel and equipment. *The I-T-E representative in your locality is fully qualified to assist you in adapting these sectionalizing recommendations for your mine. Use his services with no obligation.*



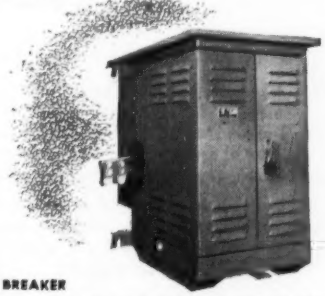
Key

2. I-T-E Type KSC Automatic Reclosing Circuit Breaker installed as overcurrent protective device between each two substations. The KSC protects feeders and equipment by detecting disturbances on either side.
3. A disconnect switch or protective device placed at not over 1500-foot intervals in every power line.
4. I-T-E Type KSA Automatic Reclosing Circuit Breaker used as an overcurrent protective device in each circuit leaving a substation.
5. I-T-E Type KSC used as an overcurrent protective device in each main branch circuit. It is rugged and compact in construction, readily portable, and can be moved as mining progresses and centers of loads change.
6. I-T-E Type KSC used as overcurrent protective device in secondary branch circuits.

Key

7. Circuits to pumps and other fixed loads have overcurrent protection at their supply ends.
8. Unimportant branch circuits such as infrequently used entries, spur tracks, etc., have switches for cutting off all power.

NOTE: In every case, sufficient feeder and return circuit capacity should be provided so that the circuit breaker will be opened by a dead short at the most remote point of the circuit.



The Heart of Protection . . . TYPE KSC
AUTOMATIC RECLOSING CIRCUIT BREAKER

The KSC was especially developed for the mining industry. It is completely metal enclosed for safety—yet readily accessible for inspections and maintenance. Overall height: 38⅝".

Be Production-Wise...Sectionalize

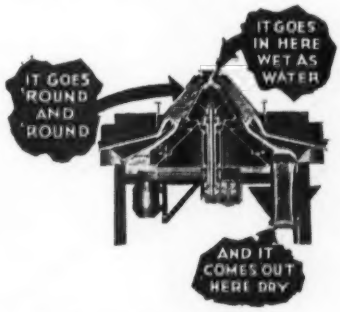
I-T-E

S-E-C-T-I-O-N-A-L-I-Z-I-N-G
SWITCHGEAR
The Leader In Technical Excellence

I-T-E Circuit Breaker Company, 19th & Hamilton Sts., Phila. 30, Pa. 31 Offices in U. S. & Canada

SWITCHGEAR • UNIT SUBSTATIONS • AUTOMATIC RECLOSING CIRCUIT BREAKERS

FOR the most economical and simple method for dewatering and drying the smaller coal sizes. The many installations in modern coal washing plants are proof of this. We shall be glad to give you the details of the installations.



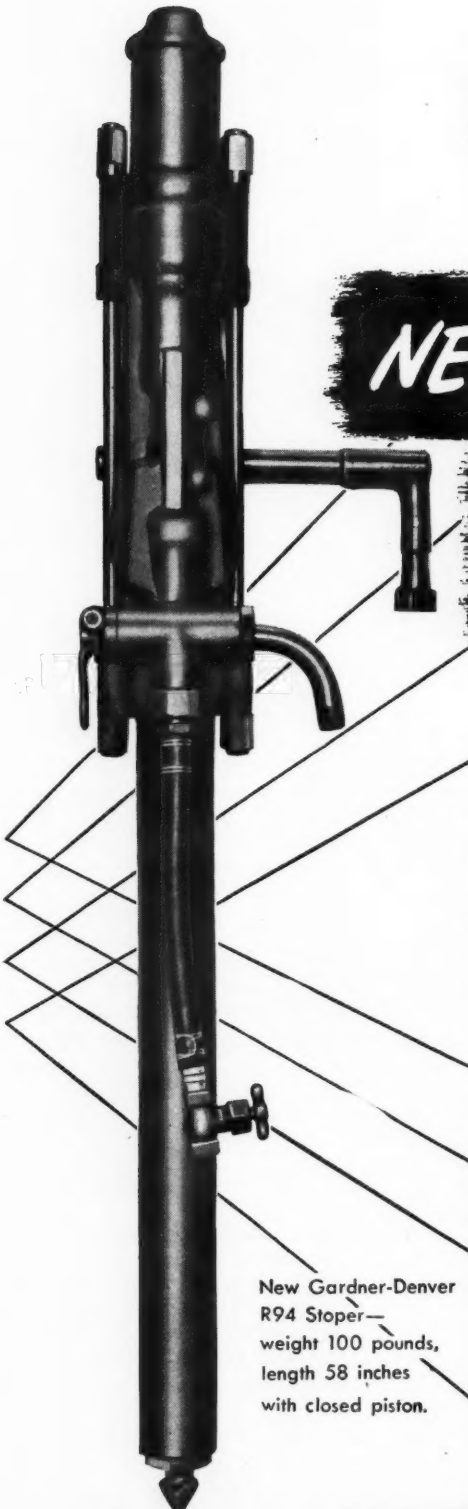
Sludge and slurry coals are also being reclaimed by using this machine. Where a large part of the ash is in the finest sizes, ash content as well as the water content is reduced.

Centrifugal and

Mechanical Industries,
INC.
3600 South Second Street
St. Louis 18, Mo.

INTRODUCING A NEW CHAMPION
IN THE LIGHTWEIGHT STOPER CLASS

NEW GARDNER-DENVER R94 SELF-ROTATING STOPER



New Gardner-Denver R94 Stoper—weight 100 pounds, length 58 inches with closed piston.

Today, Gardner-Denver proudly presents a new, lighter weight companion of the famous R104 Stoper—the stoper which is famous for its unequalled performance and reliability.

Weighing 100 pounds, the new R94 Self-Rotating Stoper retains many of the outstanding features of the R104, but also has many new features which assure leadership in its class. Ask a Gardner-Denver field engineer for a demonstration, or write Gardner-Denver Company, Quincy, Illinois.

These Features Make the R94 a Top Rank Stoper

Perfect balance and low maintenance—*assured by proper relation between drilling speed and power of feed at all pressures—correct position of holding handle—accurate weight distribution.*

Complete protection of working parts—*front end is completely protected against entrance of water by a fully automatic system of cleaning air.*

Exclusive feed cylinder—*embodies a new, removable tapered bushing for easy renewal.*

Powerful rotation—*4-pawl, with reversible pawls to assure long life. Fingertip control stop rotation is available with the R94 and conversion is easily made by changing the chuck end assembly and side rods only.*

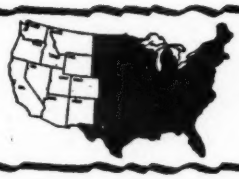
High drilling speed—*compares favorably with that of the R104 Stoper. As in the R104, the automatic valve has a short stroke and large bearing areas.*

Perfect alignment of chuck end—*a long extension on the chuck end, bearing in a deep counter bore at the front end of the hammer cylinder, preserves alignment and prevents weaving.*

Integral lubricator—*integral lubricator embodied in cylinder—controlled oil flow to chuck end and valve chest.*

GARDNER-DENVER SINCE 1859

Western States



Mountain City to Close

Mountain City Copper Co. workings at Rio Tinto, Nev., previously one of the richest copper ore bodies in the west, are being closed down immediately, according to Frank A. Wardlaw, Jr., president.

Mr. Wardlaw said the action was taken "because exhaustive efforts to find new ore bodies have been unsuccessful and further operations cannot be carried on at a profit."

He said a stockholders meeting will discuss disposition of the mining property and equipment.

Development of the mine began in 1932 and 62 per cent of the stock is owned by Anaconda Copper Mining Co.

Mr. Wardlaw emphasized that extension of the Federal mine premium plan would not have enabled the mine to continue operations.

Tunnel Being Pushed at Nabob

The Nabob Mining Company is pushing its 500-ft. crosscut tunnel in the Pine Creek area, in the western portion of Idaho's Coeur d'Alene district, with three shifts of miners. This tunnel will give greater depth on a vein system than any other mine development in that district and is expected to cut through at least four vein systems before it reaches the Nabob at 700 ft. below the present workings. The upper workings are providing the company's milling plant with capacity feed.

Antimony Property to Build Mill

Developments for increased mineral production are taking place at Tony Romano's antimony mine at Big Creek, about 12 miles south of Austin, Nev.

The Romano properties upon which development work has been going on for several years with considerable shipment of ore, have been recently incorporated as the Big Creek Milling Co. and a concentrating mill is being erected on the slope of the high mountain 1,200 ft. below the mine.

The incorporators and members of the board of directors include Tony Romano of Austin, and Frank C. Holman and Edward L. Kantor, both of Whittier, Calif.

The grading for the installation has all been done and the foundations for the milling equipment and mill building are being put in. The building on the side of the mountain will be about 30 ft. by 30 ft., designed to gravity feed and the ore will be run about 1,200 ft. from the mine to the mill by skip. The machinery to be installed is now on the ground and consists of two gasoline engines—one a Fairbanks-Morse and the other a Buick—a jaw crusher, a set of rolls and four concentrating tables. The mill is designed to have a capacity of 50 tons of ore in two eight-hour shifts and is expected to be in operation this month.

Mexico to Reduce Mining Taxes

Early in September President Miguel Aleman, in the first "state of the nation" report of his administration, promised that he soon would submit to Congress a plan "to reduce the number of taxes in effect and to set up a real national system of tax levying, including local and municipal taxes."

President Aleman said the mining industry suffered a "downfall" of 53,000,000 pesos in 1946 in comparison to the preceding year. Government mining subsidies will be continued, he said, and added the government proposes to reduce mining taxes in order to stimulate production in this field.

Colorado Safety Award

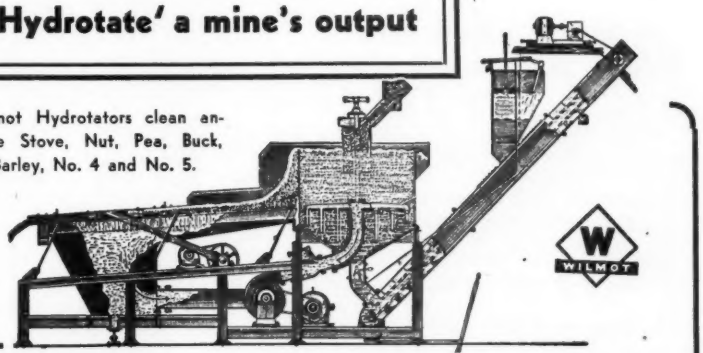
Charles A. Chase, general manager of the Shenandoah Dives Mining Co., is in receipt of a bronze plaque, first prize safety award, presented by the Colorado Mining Association and the Colorado Industrial Commission.

The bronze plate is engraved as follows: "Colorado Mining Association, Colorado Industrial Commission, Safety Award, First Prize, Large Operator, 1946." The company's name appears at the bottom.

This is the first time this award has been granted to this local mining firm. It also means that there have been fewer industrial accidents at the Shenandoah Dives property in San Juan county over that particular period than in any other similar operation in the state.

Now ONLY 2 MEN can 'Hydrotate' a mine's output

Wilmot Hydrotators clean anthracite Stove, Nut, Pea, Buck, Rice, Barley, No. 4 and No. 5.



WILMOT HYDROTATORS offer fully automatic coal cleaning. One man can tend 3 or more of these units. Self-regulating for changes in quality or quantity of intake. During periods of interrupted feed, loss of good coal is prevented by automatic controls in refuse discharge line. Let us send you complete details of the advanced engineering of Wilmot Hydrotators.

Wilmot Builds Better Breakers

WILMOT
A GREAT NAME IN THE COAL INDUSTRY

Write for Hydrotator Bulletin HR

HYDROTATOR *Preparation* EQUIPMENT

WILMOT ENGINEERING COMPANY, HAZLETON, PA.

Log Dryer Installed at Questa

The Molybdenum Corporation of America's mine and mill seven miles east of Questa, Taos County, N. Mex., in Red River Canyon continues molybdenite production under the supervision of J. B. Carman who has operated the property for the past 24 years. A log-type dryer has recently been installed for drying the molybdenite concentrates, replacing a manual drying operation.

Arizona Property Ships Fluorspar

Cooper Shapley, Jr., of Benson, is shipping five carloads a month of high-grade metallurgical fluorspar from a new development in the Whetstone Mountains, 16 miles from Benson, Ariz. The property, known as the Lone Star Mine, has been developed by more than 300 ft. of drifting along the vein with a depth of 100 ft. attained. The ore is a transparent banded fluorspar and a considerable quantity is sold to specimen hunters. The vein is said to average 6 ft. in width. Shapley is considering the advisability of putting in a washing plant to produce lump acid grade material. Eight men are employed at present. Shapley formerly owned and operated the La Purisima Fluorspar Company in Deming, N. Mex., and the Fluorspar Processing Co. of Salida, Colo.

Magma to Push San Manuel

Results of diamond drilling, in the opinion of H. E. Dodge, treasurer, have more than justified the decision of Magma Copper Co. stockholders to finance the development of the San Manuel copper deposit in Pinal County, Ariz., near Tiger. Dodge's report disclosed that proved ore deposits at San Manuel now exceed 354,500,000 tons, of which 235,000,000 tons assay 0.80 per cent copper sulphide.

Last year Magma stockholders voted to increase the company's capital stock from 410,000 to 1,200,000 shares with a par value of $10 to finance the development of the San Manuel ore body, believed to be the largest copper discovery in Arizona in many years. Magma obtained the property in 1944 by purchase option and formed the San Manuel Copper Corp. to conduct the exploration.

At Magma's main property at Superior, Ariz., a major construction program is in progress. Included in that program is the construction of a new cooling plant which is valued at approximately $1,500,000. This refrigeration plant, being erected by the J. F. Pritchard and Co. of Kansas City, Mo., will utilize an induced-draft cooling tower using pre-cooled water. At present mine officials are planning to pipe water to the plant from a well in the desert, 16 miles to the southwest.

Construction has been under way for several months on a new crushing plant and a new mill. The new mill will be of slightly larger capacity than the present one and will be modern in every respect, making for increased efficiency. If the required machinery can be obtained, the mill should be in operation shortly after the first of next year. The crushing plant is scheduled for completion this fall. Cost of these improvements is estimated at $500,000.

Mining Resumed at Chelan

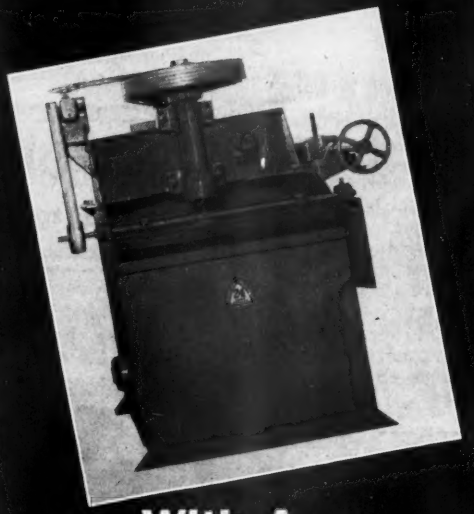
Chelan division of Howe Sound Co., at Holden, Wash., has resumed mining operations following a nine-month suspension of production while development work was under way.

Some 60 more men have resumed work in the mining operations. Most of the crew of nearly 250 men were retained while development work was being done.

Up to the time that the mill was shut down last November, a total of 491,402 tons of ore was milled during the 248 operation days, for an average of 1,981 tons per operating day. Operations are once again back on schedule.

Save More of Your Lead and Silver!

RECOVER YOUR MINERALS AS SOON AS FREE



With A

DENVER "SUB-A" UNIT FLOTATION CELL

In Your Grinding Circuit

"The firm that makes its friends happier, healthier and wealthier"

DENVER EQUIPMENT COMPANY 24 HOUR SERVICE

DENVER EQUIPMENT COMPANY

P. O. BOX 5268 • DENVER 17, COLORADO

DENVER • NEW YORK CITY • CHICAGO • TORONTO • VANCOUVER • MEXICO CITY • LONDON • JOHANNESBURG • RICHMOND, AUSTRALIA

18 BIG NEW MACKS

for Oliver Iron Mining Company

• Here's outstanding recognition for a great, new Mack. Oliver Iron Mining Co.—prominent operator in Minnesota's famed Mesabi range — greets the introduction of Mack's new Model LRSW with an order for 18 of these monster six-wheelers.

This new Mack packs its 30-ton payloads with unfaltering ease over the toughest of terrain. There's abundant power in its 275 h.p., supercharged diesel engine. Extra ruggedness in its massive all-welded frame. Positive traction at all times because of its Balanced Bogie and exclusive Power Divider which effectively transfers power to wheels having the most traction.

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All the way through, Model LRSW is engineered for its own specialized job, built to move big yardage and do it profitably.

Find out how this new Mack dumper fits in with the demands of your particular pit or excavating job. Call your nearest Mack branch or dealer — or write to Mines Division, Mack Trucks, Inc., Empire State Bldg., New York, N. Y.

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Colorado Property Back in Production

The Anchoria Leland mine, at Cripple Creek, closed since fire destroyed much of its equipment in July, is hoisting ore again. The new building replacing the old hoist house is almost completed.

The new hoist has been installed, a new transformer has been put in and power connections made.

According to Supt. Gus Nelson, the hoist and compressor house now under construction will be a great improvement over the old one. It is 60 ft. long by 25 ft. wide and has a framework of welded steel pipe to which the timbers are bolted. Windows with steel frames will complete a sturdy structure.

The Anchoria Leland, property of the Golden Cycle Corp., is located on Gold Hill just above Cripple Creek. It is operated by lessees.

New Mexico Fluorspar Property to Open

Thomas Trijo and associates expect to open up a fluorspar deposit that lies in three separate areas near Ojo Caliente in Rio Arriba County, N. Mex. The work done to date on the 11 fluorspar claims has proven the possible existence of extensive deposits and several large samples have been submitted for metallurgical testing. This district has attracted considerable attention recently with its mica, bentonite and fuller's earth occurrences.

Bunker Hill & Sullivan to Block Cave

Bunker Hill & Sullivan Mining Company at Kellogg, Idaho, is preparing to mine and mill huge tonnages of low-grade lead-silver-zinc ore. Mining will be largely a caving process. According to J. B. Haffner, general manager, the system used will be block caving and will involve around 5,000,000 tons of low-grade zinc-lead-silver ore.

Plans for the enterprise are being worked out by Bunker Hill engineers headed by C. E. Schwab, and involve a huge underground station, in which will be located an extra large crushing plant. The station is estimated at a cost of $100,000 and the crushing plant at $36,000. Modern labor-saving machinery, sink-and-float and flotation machines combined with large tonnage operations make the enterprise possible.

The area to be block caved is in the old workings, where the high-grade ore has been taken out and embraces a territory about 1,000 ft. long, 165 ft. wide and 300 ft. deep, from the old No. 5 level to the surface. The company has done 6,000 ft. of exploration work in this area to determine the size of the ore body and obtained a comparative average sample, which is estimated to be around 3 per cent lead and zinc and about one-half ounce of silver per ton.

Engineer Schwab says he expects the system will be ready for initial operation by spring and tonnage production will depend on the capacity of the milling plant. The mine will be able to produce anywhere from 2,000 to 10,000 tons per day. Engineers believe that under this system production of 20 to 25 tons per man employed will be possible as against about two and one-half tons per man, as at present.

Studies are being made of the adjoining Last Chance mine workings and other portions of the Bunker Hill workings for similar operating areas on a mass tonnage basis.

The capacity of the company's milling plants now stands at 1,800 tons per day and plans are in progress to increase this to 2,800 tons per day as starting point for the heavy tonnage program, and eventually increasing to 5,000 tons.

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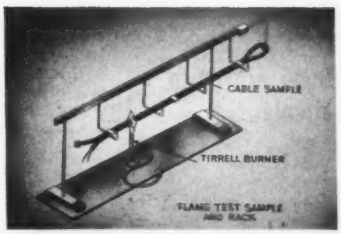

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MINING MACHINE AND LOCOMOTIVE CABLES

Ore Strike on Montana Property

Discovery of a large body of pay ore in the lower tunnel on the King & Queen claims of the Nancy Lee group at Keystone, Mont., west of Superior, is one of the most interesting mineral developments in the east Coeur d'Alene area since the discovery of the Iron Mountain mine.

The Keystone camp is in the next canyon west of the Iron Mountain mine which is now owned by the Federal Mining & Smelting Co. Mining activity in the district, which may be an eastern extension of the Coeur d'Alene District, has been held back by a lack of risk capital for its development.

In the early days the King & Queen and the O. R. & N. properties produced a large tonnage of high grade silver-lead ore, but a fault similar to the Osburn fault in this district discouraged deep development. This fault extends through the entire belt and is very difficult ground. The new King & Queen discovery is on the north side of the fault and the extent of the ore body is unknown, but enough work has been done on it to indicate it is exceptionally large.

The King & Queen is under a 10-year lease to E. G. Smith and associates of Wallace, who have constructed a modern milling plant of 125 tons daily capacity on the Missoula River just west of the mouth of Spring Gulch leading to the mine.

During the past two years Smith has produced about $50,000 worth of concentrates from the ore body in the surface tunnel workings of the King & Queen.

Assay samples taken on ore from the present strike give returns of 14.8 to 52.8 oz. silver per ton; lead from zero to 22.5 per cent; zinc from 1 per cent to 30 per cent; copper from zero to 3.86 per cent.

Increased Mining Activity in California

At Darwin, Calif., the Darwin Mines, an Anaconda Copper subsidiary, is working its lead-silver property on a substantial basis and is shipping concentrates.

Diamond drilling is reported to be disclosing ore in a virgin section of the famed Cerro Gordo lead-silver mine, five miles east of Keeler. Several properties are active in the Ubeheba district and adjacent areas. The Cerro Gordo is held under lease by W. C. Rigg of Santa Monica.

Milling of tungsten ore has been resumed at the Pine Creek properties in the Bishop district by U. S. Vanadium Corp. Approximately 80 miners are developing and mining large scheelite deposits. Driving of a 7,000-ft. lower tunnel is expected by the management is completed. The company expects to employ 225 men when mine and plant are operating at near capacity.

Equipment is being installed at the property of Tungstar Corp. to replace mining machinery destroyed by fire last year. Production is not expected by the management to be resumed until next year.

Development work is increasing at the old Monte Christo gold property operated by American Metals Co. of Colorado. The Monte Christo is located in the Mammoth Lake region and for many years produced rich ore.

Production Cut at Metaline Mine

In the wake of the President's veto of the premium price plan for metals, the Metaline Mining & Leasing Co.'s large zinc-lead mine near Metaline Falls, Wash., suspended production. President Louis H. Schermerhorn of Spokane pointed out that long-neglected development work at the mine had been intensified. The company has been producing an average of 150 tons of ore daily in the past few months. The firm is first in the area to curtail operations as a result of loss of government subsidies.

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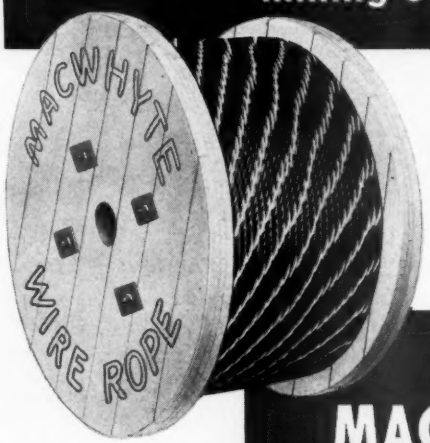

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Wasatch Mines Ship High Grade

The new ore body opened recently by lessees in the properties of Wasatch Mines Co., located at Alta, Utah, is yielding shipments of high grade silver-lead and copper ores. The strike was made in a raise from the Wasatch Drain Tunnel in property operated under lease by Tony Jacobsen and A. J. Selander, secretary-treasurer and manager of Wasatch Mines Co., reports.

Smelter settlement sheets disclose that two cars of lead-silver ore shipped contained values having a gross worth of $140.58 and $115.60 per ton respectively. The one car of 48 tons grossed $6,460 and the other of 50 tons $5,505.

Copper ore shipped from a different vein in the same area as the lead-silver vein contained copper valued at from $43 to $49 a ton, 225 tons of this ore being shipped.

While size of the ore body is not known, it is indicated that it is of substantial proportions. Seven men are operating the lease.

Silver Knight Shows Values

Gus McNight, owner of the Silver Knight properties located 11 miles southwest of Prescott, Ariz., near Copper Creek, which has been a known productive area for many years, reports that much work has been done in timbering up the original Summit No. 1 mine.

The mine was located by the late Wm. Baird in 1912 and has produced commercial ore over this entire period under the different ownerships.

While cleaning up the mine, hand samples were taken from various points along the main lead and all averaged more than 40 oz. of silver ore. One large mixed sample was sent to the American Smelting & Refining Co. plant at El Paso and showed besides the high silver content, gold in the value of $20 a ton, also 15 per cent lead and 10 per cent zinc.

It is expected that the Silver McKnight will be in operation before bad weather starts.

Roads Completed to California Mines

Roads to the historic Gold Peak and Cowboy mines in Caliente Canon, Kern County, near Randsburg, Calif., have been completed to permit start of mining operations by the operator, Mineral, Metal & Byproducts, Ltd., of Nevada.

Louis H. Mickelson, who will direct all mine operations, is said to have used the same rock replacement technique in opening roads to the mine that he used in the Navy on underground excavations for construction of the $200 million fuel storage reservoir on Red Mountain near Pearl Harbor.

A Copper Penny Commands 17 Six-Penny Common Nails . . .

This is the approximate across-the-counter price. To allow for adequate retail and wholesale margins, transportation and keg costs, the manufacturer must produce twice this many nails for a penny. A penny buys only a few less nails than heretofore.

The average price of steel as obtained by the mills is a little over 3¢ per pound — (based on weighted production of 9 major steel items, representing a substantial percentage of steel production in the United States). Including the last increases, steel has advanced only about ½¢ per pound over the last ten years.

Steel items like nails and grinding media are higher per pound than the composite price of steel. Even so, today's prices add but little to the cost of building a house or grinding a ton of ore.

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MANUFACTURERS FORUM

Coal Field Gets New 6-Yard Shovel

Delivery of a new P&H Model 1600 electric shovel was made recently to the Shen-Pen Production Company, Shenandoah, Pa. This is the second P&H electric shovel operated by this company, a Model 1400 having been in service for some time.

The new shovel will augment present Shen-Pen equipment to greatly increase coal stripping production on a job which is one of the largest in the anthracite coal fields. It includes pro-

posed excavation of 83,000,000 yards of overburden and 14,000,000 gross tons of raw coal. Operations here are expected to last 10 to 12 years on a three shift per day basis. The Shen-Pen Production Company is a subsidiary of the Philadelphia and Reading Coal & Iron Company.

The photo shows this new P&H 6-yard electric shovel shortly after it was placed in service. Among the interesting features are: Magnetorque drive which eliminates all mechanical clutching. Directron control, independent propel drive, worm gear crowd action, all-welded construction. Information on the P&H Model 1600 electric shovel may be obtained by writing Harnischfeger Corporation, Excavator Division, 4400 West National Avenue, Milwaukee 14, Wis.

Gardner-Denver Announces New Stoper

A new and lighter weight companion to the R104 Stoper has just been announced by Gardner-Denver Company.

According to Gardner-Denver engineers, the new self-rotating stoper, known as the R94, retains many of the characteristics of the R104, and in addition, has new features.

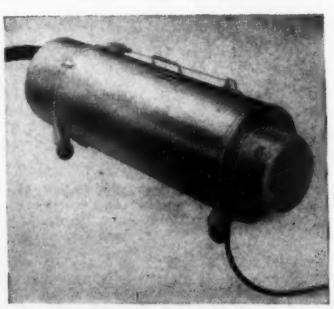
It is claimed that the R94 has excellent balance and that low maintenance is assured by a design which includes proper relation between drilling speed and power of feed at all pressures, correct position of the holding handle, and accurate weight distribution. The holding handle embodies a control which, by a turn of the wrist, regulates air to the feed leg.

The R94 has protection of the front end against the entrance of water or sludge by means of the same automatic system of cleaning air used in the R104. Alignment of the chuck end of the R94 is assured by a long extension bearing in a deep counter bore at the front end of the hammer cylinder. The feed cylinder of the R94 embodies a removable tapered bushing for easy renewal. The cylinder is increased in section near the top for greater strength and also to give a wide bearing face.

Rotation of the R94 is 4-pawl with reversible pawls. Stop rotation is available for this drill and the conversion is made by changing the chuck end assembly and side rods only. Stop rotation lever is located in the chuck end within easy reach of the drill runner and is pulled down to stop rotation and moved up to reengage it.

Welding Fume Exhauster

The new M.S.A. portable welding fume exhauster, designed for use in welding operations where stationary ventilating systems are unavailable or impractical, is described in a new bulletin (No. CU-1) published by Mine Safety Appliances Company, of Pittsburgh, Pa. It is especially suited for operations in cramped, confined quarters or where the welder must move from place to place in enclosed areas. It is claimed that the M.S.A.



exhauster removes harmful welding fumes and provides a safe atmosphere which protects worker health.

The exhauster weighs only 25 lbs., is 34 in. long and of 10-in. diameter. It is completely self-contained and requires a minimum of maintenance. The exhauster hose is easy to adjust and can, if necessary, be held in one hand while the welder works with the other.

In operation, the intake end of the hose is placed approximately 4 in. from the welding arc. The fume-laden air together with slag and sparks is sucked at the high speed into the exhauster unit where it strikes a curved baffle in the settling or separating chamber and loses over 20 per cent of its solid impurities. Particles are removed from the tubes at necessary intervals simply by pulling several times on the cord.

Symons Cone Packaged Series

Production of a self-contained portable crushing unit, the 22-in. Packaged Series of Symons Cone Crushers, is announced by Nordberg Manufacturing Co., Milwaukee 7, Wis. This unit consists essentially of a 22-in. Symons Cone Crusher, motor

and drive, mounted on a welded steel supporting base and skid. The packaged unit complements Nordberg's line of Symons Cone Crushers.

The packaged unit can be readily transported without disassembling drive and piping or draining oil from the pressure lubrication system. It can be furnished with electric motor or with Diesel or gasoline engine drive.

This new crushing unit is especially applicable to contractor type service. It is also a useful unit for semi or fully portable operations, or for stationary plant operation as a compact, self-contained, secondary reduction

unit. It can be mounted in the field on shallow piers or timbers, or it can be fitted onto chassis for wheeled transport.

The discharged product can be drawn off on a belt conveyor or bucket elevator from anyone of three sides of the unit. Capacity of the 22-in. crusher varies from 20 tons per hour at ⅜-in. setting to 60 tons per hour at about 1½-in. setting.

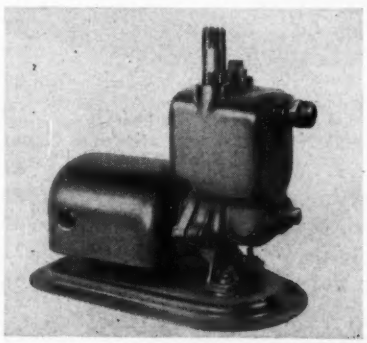
The electric-driven unit is furnished with 25 hp. 1,200 rpm. motor (for 60 cycle service), starter with push button station, V-rope drive and safety guard. The lubricating system includes a safety "Mercoid" switch. The oil pump is driven through V-belt drive from the crusher countershaft.

The shipping weight of the electrically driven unit is 10,500 lbs., and of the engine driven limit, 12,400 lbs. The overall dimensions are 122½ in. long; 71½ in. wide, including V-belt drive and housing, and 86½ in. high.

Mine Spray Pump

Illustrated is the Gorman-Rupp mine spray pump developed for use in and around mines for dust control purposes, and other mine and stockpile applications.

Weighing only 27 lbs. complete, it is easily carried from place to place



and its compact size allows its use in small spaces. By fitting the discharge pipe or hose with a nozzle a variety of sprays can be obtained. The pump will lift water up to 25 ft. and deliver 8 g.p.m. at 40 lbs. pressure. It is powered by a Lamb Electric ½ hp. Universal type electric motor, 110/115 volts AC of 60 cycles or less, or DC.

It is stated that the pump's self-priming design assures quick performance of the pump whenever called upon. There is only one moving part, the impeller. In servicing this impeller can be removed by unskilled labor and ordinary tools.

The mine spray pump is the latest of the line of Gorman-Rupp mine pumps which includes five sizes of mine gathering pumps. Complete information on these pumps can be obtained from the Gorman-Rupp Company, Mansfield, Ohio.

The Rucker Company in Expansion Program

New name and corporate ownership for The Rucker Company of Oakland, Calif., was announced recently by Clark E. Rucker, owner. Formerly Rucker Vaughn Co., the firm will operate henceforth as The Rucker Company. Mr. Rucker bought the interest of C. S. Vaughn and is now sole owner.

With the change of name, the company is also expanding its operations into the sales and distribution of hydraulic as well as pneumatic equipment. The firm was recently appointed representative for the Hanna Engineering Co., of Chicago. Among lines now handled are cylinders and valves, compressors, regulators, lubricators, filters, drill presses, hoists, radial drills and saws, multiple drill heads, electric motors and drives.

Newly appointed to the organization is George H. Wilson who will be sales manager. Mr. Wilson, a Massachusetts Institute of Technology graduate, served during the war as first class aviation pilot in the Navy and subsequently as technical consultant to the War Department.

— *Announcements* —

To coordinate the recently-announced program of modernization and expansion of production facilities in the Woven Wire Fabrics Division, **John A. Roebling's Sons Company**, through its president, Charles R. Tyson, announces the appointment of **F. G. Hoyt** as general manager. Mr. Hoyt, who is widely experienced in the aggregate wire screen and allied fields, will be ably assisted in his new capacity by **J. Fennell Berger**, assistant manager of sales, and **F. Clifford Peet**, superintendent of production.

F. G. Hoyt

* * *

The Mining Division of **Kennametal Inc.**, Latrobe, Pa., announces the appointment of **Robert T. Smith** to cover the state of Ohio as sales representative. Mr. Smith will be located in Glenshaw. **Thomas C. Miller** has been appointed sales representative to cover eastern Kentucky. Mr. Miller is located in Pikesville, Ky.

* * *

Frank A. Young, a representative in **Allis-Chalmers** Duluth, Minn., branch office since 1944, has been named manager of the office, according to an announcement by J. L. Singleton, vice president, director of sales, general machinery division.

An employe of Allis-Chalmers since 1923, Young started work in the company's shops, has served in the erecting department, engaged in special field work, and was connected with the firm's basic industries department before being transferred to Duluth.

* * *

The **Koehler Manufacturing Co.** has announced the placing of complete and exclusive sales distribution and servicing of Wheat Electric Miners' Lamps and Koehler Flame Safety Lamps throughout the western hemisphere in the hands of **National Mines Service Co.** of Beckley, W. Va. The president of National Mines Service Co. is **Gordon MacVean** who is well known to the mining industry. He was formerly associated with Mine Safety Appliances Company.

CATALOGS AND BULLETINS

BOTTOM-DUMP COAL TRUCK. *The Euclid Road Machinery Co., Cleveland, Ohio.* Two new catalog folders have recently been released to Euclid distributors and are available to those interested in rear and bottom-dump Euclid coal haulers. Form No. 105 features the Model TD rear-dump Euclid of 22-ton capacity. This truck is designed for hauling big loads on mining and construction projects and is powered by a 275 hp. diesel engine. The 32-ton bottom-dump Euclid coal hauler is described in catalog No. 216. This is a large-capacity, high-speed hauling unit which is designed especially for coal haulage in open-pit mines.

CAR SHAKEOUT. *Robins Conveyors Division of Hewitt-Robins, Incorporated, Passaic, N. J.* Bulletin No. 128-A is a 12-page booklet which describes in detail the Robins Car Shakeout. A photographic spread serves to illustrate the application of the Shakeout and a number of operations. The text discusses saving of time, labor, and costs when using the Shakeout.

CIRCUIT BREAKER. *I-T-E Circuit Breaker Co., Philadelphia, Pa.* Booklet 4611 is an eight-page folder which will answer some of the questions that might arise in regards to the type KSC circuit breaker. A diagram, showing a typical sectionalized mine, electric distribution system, is included on the back cover. The booklet has been divided into various sections containing full information about the type KSC circuit breaker; functions, applications, advantages, and construction.

COAL CLEANER, *Roberts & Schaefer Co., Chicago, Ill.* In a brief 4-page bulletin, a new Unit Hydrotator for small tonnage coal cleaning is described in detail. The publication gives a diagrammatical lay-out of the flow sheet and lists in tables the results of hydrotator operation on bituminous coal. On the last page of the bulletin is a diagram showing the over-all dimensions. The text describes the operation procedure of this fully automatic cleaner.

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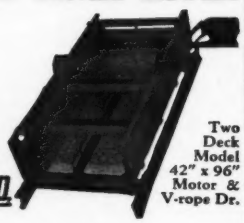

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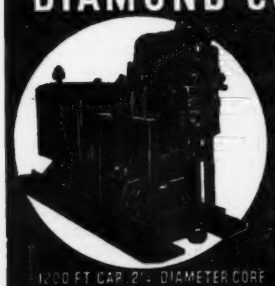

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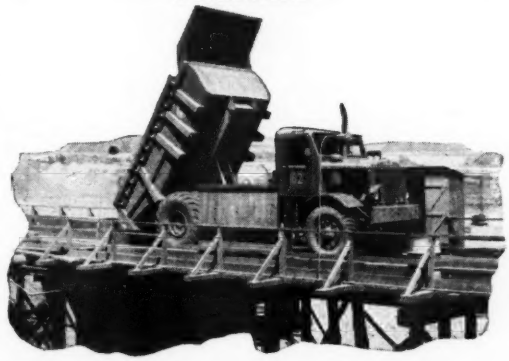
Sauerman Bros., Inc.	75
Screen Equipment Co., The	70
Sheffield Steel Corp.	85
Standard of California	16
Timken Roller Bearing Co.	51
Union Pacific R. R. Co.	72
United States Rubber Co.	8-83
Universal Vibrating Screen Co.	88
Webb Corporation	65
Wilmot Engineering Co.	79
Worthington Pump & Machinery Corp.	12
Young, L. E.	67

The Model T Rear-Dump Euclid has abundant power and speed for steep grades. Distribution of weight and large tires result in excellent traction and flotation.



Dumping 22 tons of iron ore into drive-over hopper on the Mesabi Range in Minnesota. Load is shed quickly because of smooth body interior and high dumping angle.

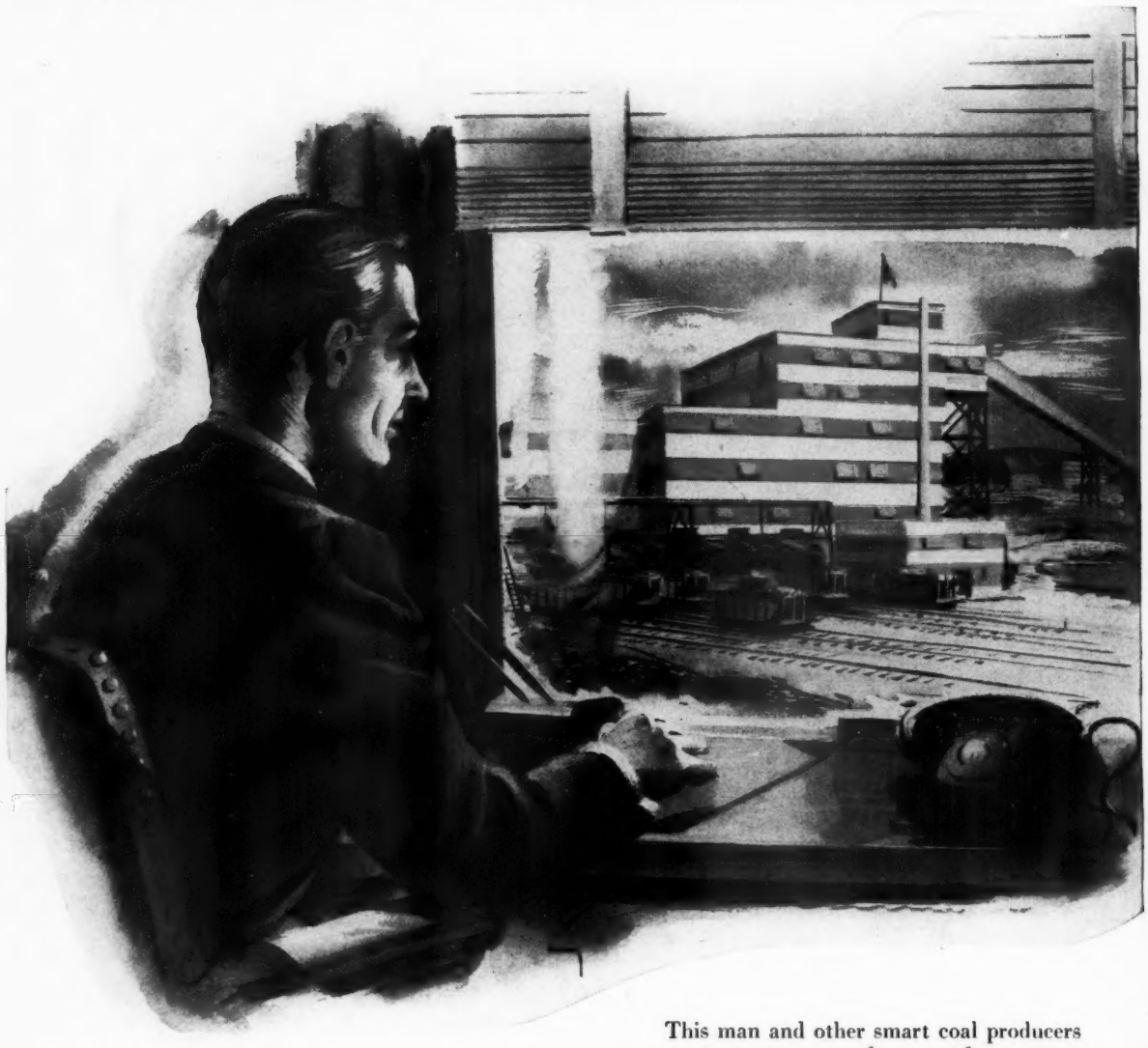
DESIGNED to work with large loading equipment, the Model T Euclid has extra large capacity and unusual power and speed for steep grades. Low loading height, large top area, fast hoist action, high dumping angle, exceptional maneuverability and traction, and high ratio of horsepower to weight . . . all of these Euclid features contribute to efficient performance.

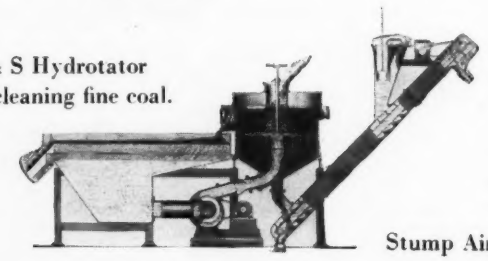
This model has a struck measure capacity of 14.8 cu. yds. and payload capacity of 44,000 lbs. Powered by Diesel engine of 200 to 275 h.p. rating, top speed with capacity payload is 31.2 m.p.h. Hydraulic steering is standard equipment. The drive axle is full-floating and planetary type double-reduction, built for big loads, large engines, and heavy service.

Wherever extra capacity and power are required to move large yardages on difficult hauls, the Model T will do the job with speed and efficiency.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

HERE IS A MAN WHO MAKES HIS COAL WORTH MORE





R & S Hydrotator
for cleaning fine coal.

This man and other smart coal producers extract every ounce of revenue from every ton of coal they mine. Only through planning and careful engineering can this be done—a Roberts & Schaefer specialty for over forty years—which has developed the Hydrotator Process illustrated here and used in so many successful coal cleaning plants.

It will be worth your while to consult Roberts & Schaefer about their Hydrotator, Hydro-Separator and Stump Air Flow Process and specialized engineering service.

ROBERTS and SCHAEFER CO.

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